THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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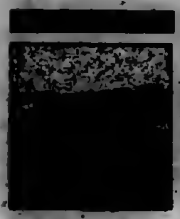

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AT/370 unveiled, enhancements to XT/370, 3270-PC

By Eric Bender
CW Staff

RYE BROOK, N.Y. — The latest flood of IBM announcements, made last week, also featured a Personal Computer AT/370, enhancements to both the Personal Computer XT/370 and the 3270 Personal Computer, and a family of office automation software products designed to run on IBM Personal Computers, System/36 and IBM 370-architecture systems.

IBM's new Office System Family programs will provide full-function text editing, library services and electronic document distribution in networks of Personal Computers, System/36 and 370 systems, the company said. Among announcements are new ver-

See AT/370 page 6

IBM mainframes debut

Gives users choice between 3083 Model CX, high-end dual-processor 4381 Model Group 3

By Tom Hoehel
CW Staff

RYE BROOK, N.Y. — IBM last week expanded its mainframe processor line with two systems: an entry-level addition to its 3083 processor line, called the 3083 Model CX, and a dual-processor version of the company's 4381 processor, called the 4381 Model Group 3.

Highlights of the announcement include the following:

■ The 3083 Model CX offers roughly 75% of the performance of the larger 3083 Model EX processor and is field-upgradable to other members of the 3083 processor line. IBM said users who install a 3083 Model CX have the option of gaining a ten-fold improvement in performance if they migrate from the Model CX to IBM's top-of-the-line 3084-QX processor.

The 3083 Model CX is available with eight or 16 channels and 8M, 16M, 24M or 32M bytes of main memory. The Model CX is capable of running the same programs as other models of the 3080 family of processors, and all peripherals that currently attach to 3080 series processors can be used with the Model CX.

The 3083 Model CX costs $330,000, including CPU, 3082 processor controller, 3087 Model 1 cool-

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TOP OF THE NEWS

Memory loss. Some IBM 4300 series users who have tried to upgrade to a 4381 from a smaller machine have found doing so meant losing as much as 1M byte of virtual memory. Page 2.

■

Rising like a phoenix from the ashes, the U.S. Postal Service was able to restore its data communications network a mere 36 hours after a spectacular fire at its headquarters recently. Page 11.

■

AT&T said it will announce a service that nearly doubles the channel capacity of T-1 circuits, from 24 digital voice channels to 44 on a standard 1.5M bit/sec T-1 circuit. Page 12.

Now he's putting telephones in airplanes. John D. Goeken, the creator of MCI Communications Corp. and builder of one of the nation's largest terminal networks, speaks out on his pioneering efforts and future plans. Page 15.

■

Don't cash in your chips just yet. Although the wild growth in semiconductor shipments has abated, this may be just a temporary lull, according to industry indicators. Page 121.

■

Multiuser micro a tough DP sell

By Paul Korzeniowski
CW Staff

While MIS managers have been inundated with information concerning multiuser microcomputers, few have been persuaded to purchase one.

"Multiuser microcomputers are a small- to [medium-size] business phenomenon; they really do not have a place in large corporations," said George F. Colony, president of Forrester Research, Inc., a Cambridge, Mass., consulting firm.

See MIS/PC page 8

Debate stirs anew over VDT health concerns

Study suggests VDT emissions have adverse biological effect

By Maura McEnaney
CW Staff

The controversy over health hazards related to VDTs is surfacing again.

Latest developments in the issue stem from recent scientific reports suggesting that very low-frequency radiation emissions from VDTs could be biologically harmful.

Some scientists now say magnetic field pulses from a VDT's fly-back transformers — which control an electron beam's movement across a screen — are similar in shape and intensity to the magnetic pulses that Dr. Jose Delgado of Madrid used in experiments in 1982. Those experiments suggested that certain pulsed magnetic fields — vastly weaker than the Earth's own natural magnetic field — altered the development of chick embryos.

The so-called "Delgado effect" has been a topic of controversy within scientific circles, particularly because the findings have

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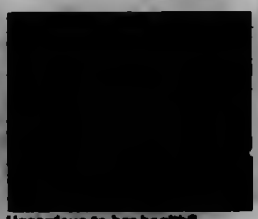

Hazardous to her health?

Union members seeking redress via contracts

By Kathleen Sullivan
CW West Coast Bureau

Although close to two dozen states have introduced legislation regarding the use of VDTs, none has been successful in passing protective laws for VDT operators. But some clerical workers have found another avenue to address their concerns — union contracts.

"In all of our contracts negotiated during the last year or so, we have certainly seen that office automation is a big factor," said Denise Mitchell, a Washington, D.C.-based spokeswoman for the Service Employees International Union, District 925.

In Canada and the U.S., clerical workers have identified a number of issues of concern relating to the introduction and use of new technology in the office.

They have raised questions on a broad range of topics: the importance of ergonomically designed computers and work areas; health and safety issues, including a concern

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NEWSPAPER

IBM DOS/VSE users lose memory in 4381 conversion

By John Desmond
CW Staff

ST. PAUL, Minn. — When the Sisters of St. Joseph Data Center, serving two hospitals, two high schools, a private college and a junior college here, recently switched from an IBM 4341 to a 4381 mainframe, the center experienced an unanticipated operating system glitch that the DP director called "a shock."

An IBM spokesman told the installer, A. Gordon Thomas of Davis, Thomas & Associates, Inc., DP consultants in Minneapolis, that other IBM 4381 users have also complained about experiencing the problem during installation.

The problem affects users who run IBM's DOS/VSE operating system on an IBM 4321, 4331, 4341 or 4361 and who then switch to an IBM 4381 running DOS/VSE. Such users lose some of their 16M-byte virtual memory in the conversion to a 4381; one user said he lost 1M byte of storage in virtual memory.

As Thomas explained, E mode is a microcode option that splits 16M bytes of virtual memory among 12 partitions in the DOS/VSE operating system. For example, a user could run 12 payroll jobs at the same time, one in each partition, each relying on a portion of the 16M-byte virtual memory.

The 4381 running DOS/VSE is not shipped with the E mode option. Instead, the 4381 runs in the IBM 370 mode, which subtracts the amount of real storage used to set up partitions from the 16M-byte virtual memory, according to Thomas. The result is that users have less than a 16M-byte virtual memory and thus cannot bring up the 4381 before making corrections, Thomas said.

Ron Mumm, St. Joseph's DP director, said that during the installation at Sisters of St. Joseph, the 4381 had been carefully scheduled, and, "we were physically switching everything over to the 4381," when the company was told the new machine would not run E mode. "We were not prepared for it. We had to abort [totally] and start over again," Mumm said. Sisters of St. Joseph completed the installation two and a half weeks later, after Thomas had worked out a solution.

To correct the problem, Thomas said, certain operating system parameters must be changed and tested, and the size of DOS/VSE partitions must be recalculated. "IBM is forgetting to tell people that VSE only runs in a 370 mode on a 4381. It's not the type of thing that will keep you down forever, but it's one of those little snafus you go through that costs time during the installation," Thomas said.

> *'IBM is forgetting to tell people that VSE only runs in a 370 mode on a 4381.'*
> — A. Gordon Thomas, DP consultant

Asked if IBM salesmen are telling customers that E mode does not run on the 4381, spokeswoman Anna Bishop said, "I have no way of knowing whether any individual person is telling anybody anything." She did say the information is contained in the customer's company literature.

Mumm said the information was in literature given to him, "but we were not aware of it. No one nailed it down and said you've got to be aware of this," Mumm said.

Asked why IBM does not offer E mode on the 4381, Bishop said that E mode "does not significantly add value over 370 mode in processors in this performance range. The continued evolution of DOS/VSE function and structure has resulted in performance in 370 mode on the 4381 that is roughly equal to what performance would have been in E mode." She added that E mode is being supported in the VSE/SP Version 2.1 scheduled for release in April, but that this still will not make E mode available for the 4381.

Another user, Kroy, Inc. of Scottsdale, Ariz., lost approximately 1M byte from virtual memory when the firm began running DOS/VSE in the 370 mode on the 4381, according to Michael Dillon, senior systems programmer with the firm. "We had 15M bytes left," he said of his virtual memory. As a result of the loss, his DP shop cannot run as many jobs at once. Dillon said he has taken no scientific measurements to verify IBM's claim that the lost capability is made up by greater throughput.

Dillon said he has invested about 16 man-hours to correct for the loss of the E mode option.

Another user, J. Gene Burger, operations manager at the Baltimore Life Insurance Co., said he was alerted to certain 4341-to-4381 conversion problems from a July meeting of Guide International IBM users in Montreal. Despite "a lot of research and advanced planning" for the switch, Burger said, he was still surprised by problems experienced during installation.

As a result of the problems, Baltimore Life could not immediately run its policy administration system program — described by Burger as the company's "lifeblood" — nor the report writer for that program. "Running in 370 mode automatically meant we lost 2.6 partitions," or approximately 600K bytes of virtual memory, Burger said. "It's caused a scheduling bottleneck, but with the 4381 I can get the work done so fast that it almost doesn't matter."

But because the company needs to run two IBM CICS programs, one for production and one for testing, he needs more virtual memory than his operating system provides.

Asked if IBM informed him about the potential problems of switching to the 4381, Burger said, "It needs to be spelled out more in their planning guide that this can really get you. It's all there in the books, but they don't tell you what you might lose. They don't like to say those things. But it would have saved me a lot of time. It cost me more time than it should have."

CORRECTION

The purchase price for Sperry Corp.'s 1100/92 processor was incorrectly listed in the *Computerworld* Hardware Roundup on mainframes [CW, Aug. 20].

The price should have been $4,854,953 for a 16M-byte configuration.

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Upcoming AT&T service will nearly double transmission capacity of T-1 circuits/13

CW at Wang Users Meet: Users of the Wangnet local-area network said any problems they have experienced with the net have been resolved . . . If fear of computers is left unattended, it can adversely affect the success of office automation in an organization . . . The same methods used to manage the growth of DP can be used to manage OA/14-18

CW interviews John D. Gaskin, the man behind both MCI Communications Corp. and Satellite Business Systems/15-16

Users at the recent Intech '84 conference balked at the idea of single-vendor OA solutions/19

A teenage hacker recently took a trip to London, where he demonstrated the need for computer security in British computer systems/22

The MIS department at a small New York bank was unprepared for the twofold growth that resulted from a merger, but it is catching up rapidly/23

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In a year, a telecommunications company transformed its manual business and manufacturing processes to automated systems with few problems/25

Unscheduled downtime has become the norm for the designer of a computerized surfing scoring system/26

There are enormous opportunities in the computer industry for people who have positive attitudes, according to the inventor of the industrial robot/31

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UNIONS from page 1

about the effect of computer use on general health, stress levels, vision and pregnancy; the impact of computers on the quality of work; and the changing nature of work under the new office technologies.

During the past few years, a growing number of union members have been successful in translating some of these concerns into clauses in their union contracts. It hasn't been an easy task, Mitchell said, because these unions are charting new territory. "We're still breaking new ground," she said. "Each contract takes the issues a little further along or addresses the issues in a slightly different way."

Many unions use a 1980 study by the U.S. government's National Institute for Occupational Safety and Health (Niosh) as the starting point for developing their own contract language. The Niosh study made a number of recommendations concerning visual testing, rest breaks and workplace design.

In addition, the SEIU distributes a pamphlet on model contract provisions, which covers wage and job classification changes, planning and timing of the introduction of new equipment, ergonomic specifications, health and safety considerations, transfers for pregnant operators, training and job redesign.

Mitchell described District 65, an office worker's union affiliated with the United Auto Workers that has a contract with Boston University, as the union that has done "the most far-reaching work" in VDT contract language.

Last spring, the 9,000-member Hospital and Service Employees International Union Local 399, based in Southern California, ratified a contract with the Kaiser Hospital Foundation that granted a number of union requests regarding VDT use. Included among them was "super seniority rights" for pregnant VDT operators, which allows staff members to transfer to another job for the duration of their pregnancy even if the work carries a higher seniority rating.

The hospital also agreed to allow VDT workers the right to "periodically move about" the office, in addition to regular breaks, said Tom Ramsay, a union spokesman, who explained that some research has identified lack of mobility as a possible cause for some health problems associated with VDT use. In addition, the contract provides for extended vision benefits for VDT operators, Ramsay said.

In San Francisco, the Office and Professional Employees International Union recently won an accord with the University of the Pacific's School of Dentistry in which the school agreed to "make a reasonable effort" to find alternative work for pregnant VDT operators.

However, other unions have been stonewalled in their efforts to include protective VDT language in their contracts. In recent talks with Australian-owned Quantas Airways, a Calif.-based local of the International Association of Machinists and Aerospace Workers (IAM) failed to win its VDT-related requests.

"We asked for the Niosh recommendations," IAM spokesman R. W. Thomas said. "But they wanted to hear nothing of it."

VDT from page 1

never been repeated. In a story published last week in "VDT News" (an independent newsletter covering health and safety topics published in New York City), several researchers reported that the waves and intensity of the magnetic fields being emitted from VDTs are similar to those used in the Delgado experiment.

One of those researchers is Dr. Arthur Guy, director of the Bioelectromagnetics Research Laboratory at the University of Washington's School of Medicine in Seattle. Guy reported in June that the magnetic field pulses from VDTs have some similar characteristics to those used in Delgado's experiments. But Guy also said there are more dissimilarities, particularly in the pulse widths and their shapes.

Richard Tell, a physicist with the Environmental Protection Agency's (EPA) radiation lab in Las Vegas, reported the measurements of the VDT magnetic field pulses at a July meeting of the Bioelectromagnetics Society.

"VDT News" reported that "At up to 50cm from VDT screens, Tell measured time rates of change of the magnetic field to be in the same range as those used by Delgado."

To date, however, no definitive link has been established between VDT emissions and health problems.

Last week the EPA's Tell said "I don't think what we know today shows there's any kind of a hazard involved with VDTs." Although the findings are "worth looking at . . . I don't think it's a reason for alarm," he added.

David Duarte, press officer for the Food and Drug Administration (FDA), refuted a published statement that the FDA would come out with a revised policy statement. "We are going to have to say something about these studies," he said. "At this moment, we haven't changed our position that VDTs are safe. . . . One study would not cause us to change our opinion."

Charlotte LeGates of the Computer Business Equipment Manufacturers Association said her association has no reason to believe that the new finding is cause for alarm. "The reason that Delgado's study was difficult to repeat was that he was using a particular wave form that does not come from VDTs."

Elaine Taber, program director at 9 to 5, the national organization for office workers and a critic of VDT safety, maintained that VDT precautions still need to be taken until more concrete evidence on the safety of the machines is available.

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IBM unveils office software

RYE BROOK, N.Y. — The new IBM Office Systems Family software programs are designed to boost links between Distributed Office Support System (Disoss) and Professional Office System (Profs) environments. They provide common text and personal services functions across IBM office networks, including Personal Computers, System/36s and 370s.

New family members include:

■ Personal Services/PC, a package permitting users to exchange text documents, Personal Computer files and messages with System/36 and 370 users via Disoss/370. Availability is planned for the first half of 1985 at a cost of $250.

■ Personal Services/36, a product allowing System/36 users to exchange documents locally and with Personal Computers through networks and other System/36 systems, Displaywriters, 5520 systems and Disoss users. The $3,000 package will be shipped by July.

■ Personal Services/370 gives IBM 3270 terminal users access to Disoss/370 electronic mail and library functions and the ability to create electronic distribution lists, IBM said. Initial license fees are $2,250 for MVS and $1,050 for VSE, with monthly fees of $750 and $350, respectively. Availability is planned for April, 1985. Disoss/370 Release 3.3 will enable Disoss and Profs users to exchange final-form documents when available in March, 1986. Initial license fees are $4,280 for MVS and $1,605 for VSE systems; monthly licensing fees are $1,390 and $535, respectively.

■ An enhanced version of Profs for VM users that permits exchange of final-form documents with Disoss. It will be available in the fourth quarter of 1985 at an initial licensing fee of $4,000 and a $700 monthly fee.

IBM is located in Rye Brook, N.Y.

Honeywell offers Gcos 7 for DPS 7s

WALTHAM, Mass. — Honeywell, Inc. last week unveiled Gcos 7, a replacement for its older Gcos 64 operating system for users of the firm'e DPS 7 line of mid-range mainframes.

Users of the most current version of Gcos 64, Release 501, reportedly can convert to the Gcos 7 operating system without having to recompile programs. A spokesman said most DPS 7 users will be able to make the conversion to Gcos 7 over a weekend.

Basic features include multitasking, a virtual memory capability, diagnotics resource allocation, CPU dispatching and load balancing. Gcos 7 is also said to provide features to handle data base management functions, query and transaction processors, as well as a data dictionary and screen editing and networking functions. Gcos 7 can be used in centralized and distributed environments in either batch or interactive modes, the company said.

DPS 7 systems running Gcos 7 can communicate with a variety of terminals and remote processors including Honeywell's DPS 6 and DPS 7 systems. Gcos 7 products support file exchange and host-to-host distributed job processing through Honeywell's Distributed Systems Architecture networking software and via terminal concentration and emulation.

Gcos 7 will be available late in the second quarter of 1985. The basic components of Gcos 7 have a monthly license fee of $1,121. Basic system options such as support for coupled systems, distributed job processing, file transfer and a remote batch feature range in price from $18 to $104 per month. Software packages that allow Gcos 7 to function in production, information processing and development environments cost from $37 to $883 per month.

Honeywell is located at 200 Smith St., Waltham, Mass. 02154.

AT/370 from page 1

sions of the Distributed Office Support System/370 and the Professional Office System that allow users in those environments to exchange final-form documents (see story above).

The Personal Computer family introductions include a new version of the Personal Computer AT — the Personal Computer AT/370 — said to process host computer programs from 25% to over 100% faster than the current Personal Computer XT/370. The AT/370 can act as an IBM 370 CMS workstation, as an IBM 3278/3279 display terminal or as a standard AT. The AT/370 reportedly can support up to 8M bytes of virtual memory. The system is priced at $9,795 and will be offered in January. IBM is offering a $3,095 upgrade from the AT.

A new model of the XT/370, the 5160 Model 589, includes an adaptor option allowing the system to act as a 3278 or 3279 terminal connected to a host processor via controller. The Model 589 costs $8,395. Basic XT models can be field-upgraded to the new XT/370 model at a cost of $3,095, according to IBM.

IBM also announced a new application program interface for the 3270 Personal Computer, part of the controller, said to allow users to send host data directly into personal computer spreadsheet applications without making programming changes on the host. The interface will be available in the second quarter of 1985.

Two new 3270 Personal Computer versions scheduled for shipment next month accept a 17-in., flat-panel plasma display monitor, available as an option for $3,695. The System 5271 Model 24 with dual floppy drives costs 5,990. The Model 26 with one floppy disk drive and a 10M-byte hard disk drive costs $7,550.

IBM is in Rye Brook, N.Y. 10573.

IBM from page 1

ant distribution unit, 8M bytes of main memory and eight channels. The system will be available in the second quarter of 1985.

The purchase price for an additional 8M bytes of main memory is $130,000. An eight-channel upgrade to the Model CX also costs $130,000. Those upgrades will be available in the third quarter of 1985. The cost of upgrading a 3083 Model CX to a 3083 Model EX costs $175,000. That upgrade will be available in the first quarter of 1986, IBM said.

■ The 4381 Model Group 3 is a dual-processor version of IBM's 4381 Model Group 2. Each processor in the Model Group 3 complex has its own channels and a high-speed buffer, but they share a common main memory. The Model Group 3 uses IBM's 256K-bit memory chips to offer between 8M and 32M bytes of main memory. Up to 18 channels can be attached to the Model Group 3 processor.

IBM said the Model Group 3 offers between 1.7 and 1.9 times the internal throughput of the 4381 Model Group 2. A spokesman said users of the Model Group 3 in a commercial job mix will get up to 1.7 times the throughput of the Model Group 2, while users operating the Model Group 3 in a scientific or engineering environment can realize a performance improvement of up to 1.9 times. Up to 18 channels are available on the Model Group 3, IBM said.

The 4381 Model Group 3 processor with 8M bytes of main memory and 12 standard channels costs $825,000. Current users of the 4381 Model Group 2 processors can field-upgrade to the Model Group 3. A conversion from a 4381 Model Group 2 to a Model Group 3 with equivalent channels and memory costs $249,420. The Model Group 3 will be available in the second quarter of 1985, IBM said.

IBM also said it will make the 256K-bit memory chips available to users of the 4381 Model Group 2. In doing so, IBM said the main memory capacity of the Model Group 2 has been increased from 16M to 32M bytes. Main memory upgrades for the 4381 Model Group 2 cost $80,000 for 8M bytes and will be available for field installation in June 1985, IBM said.

Industry analysts had been expecting IBM to unveil a dual-processor version of the 4381 for some time. The low-end 3083 Model CX took some analysts by suprise. Hank Janson, an analyst with International Data Corp. in Framingham, Mass., noted that the performance of the newly announced 4381 Model Group 3 seems to overlap the performance of the 3083 Models CX and EX. He said that IBM has not made it clear why a user would want one system over the other.

One analyst noted that IBM did not appear to unveil any new technology with either processor announced last week. The anlayst said the 4381 Model Group 3 appears to be a throwback to the attached processor concept IBM used on its earlier 3033 line of mainframes, and the 3083 Model CX appeard to be a lower priced, less powerful version of other 3083 models.

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MISFIT from page 1

Colony's sentiments were echoed by industry analysts and MIS managers recently interviewed by *Computerworld*. A scarcity of software, an inability to integrate multiuser microcomputers with mainframe and microcomputer systems and the lack of a powerful, multiuser microcomputer from IBM (the IBM Personal Computer AT only supports up to three users) were listed as reasons for the dearth of large companies using multiuser microcomputers.

"A chief problem with multiuser systems is that they do not run existing application software," noted Margaret H. Levine, manager of office systems at Columbia Pictures Industries, Inc. in New York.

Current multiuser software is too specific to meet corporate needs, according to Colony. "The corporate user is not looking for a specialized package like a medical general ledger package," Colony said. "Yet [a specialized package] is usually what is offered on these microcomputers. Rather, he is looking for integration with larger systems."

Often the larger system is an IBM mainframe. "We are looking for microcomputer-to-mainframe integration," said Warren Kress, microcomputer manager at Volkswagen of America, Inc. in Warren, Mich.

"Since we have an IBM mainframe, we are [biased toward] IBM and look to IBM products like Profs and Dissos for integration rather than to a multiuser microcomputer," he added.

"We had 200 employees working with [Information Builders, Inc.'s] Focus," Kress said. "It has a simultaneous update feature that allows two people to concurrently work with one file. That feature was used less than 5% of the time. Since so few users simultaneously access the same file, it is probably more cost-effective to use a package like Focus than to buy a multiuser microcomputer."

Levine added, "We are more interested in a network rather than a multiuser microcomputer. Generally, users want to share peripherals, not a CPU. Personal computers gained popularity because they reduced mainframe CPU contention. A multiuser system would result in additional contention problems."

IBM's recent announcement of the IBM Personal Computer AT, which included a three-user version of Microsoft Corp.'s Xenix, may heighten interest in multiuser microcomputers, but it is not clear if the Big Blue stamp will lead to multiuser purchases.

"We are interested in the AT's multiuser capability and plan to explore its uses," said Gene Malmin, project manager for microcomputer support at Columbia. "But, I have some reservations. We are a mainframe shop, and whenever we need a multiuser application, we turn to the mainframe."

Kress questioned IBM's commitment to Xenix. "Xenix should not be taken seriously as an answer to the question of multiuser systems," he said. "IBM could push [it] seriously as a programming tool, but not as an operating system. Unix is just not user-friendly."

Colony concluded, "I just don't see multiuser microcomputers ever playing a significant role in large corporations."

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Microsoft tool delayed again

BELLEVUE, Wash. — Microsoft Corp. has again postponed the initial shipment of Microsoft Windows, a device-independent microcomputer operating system environment. Announced in November 1983, the product's shipment date has slipped from April 1984 to June 1985.

The product promised to bring portability to microcomputer software. An application written to Windows reportedly would run on any microcomputer that supports the operating system environment.

In addition to portability, when released, Windows reportedly will allow users to load and manipulate concurrently a number of applications and move data from one application to another. The product will boast significant graphics capabilities, since it will support bit-mapped graphics and a mouse, according to the vendor.

Microsoft is located at 10700 Northrup Way, Bellevue, Wash. 98004.

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Civil rights issues fuel L.A.'s warrant system changes

By David Gimes
CW Staff

LOS ANGELES — Early one morning in March 1979, William Jones was driving along Century Boulevard here to the grocery store to buy milk for a friend's baby.

Suddenly, Jones was stopped by a Los Angeles County sheriff because of a minor traffic violation. The sheriff took Jones' driver's license, returned to his patrol car and radioed the information to the computerized warrant system used by the county.

The computer check showed that several outstanding warrants had come up under the name William Jones. Despite his protests that he was the wrong man, Jones was taken to the police station and booked.

Jones spent two weeks behind bars before several courts cleared him of each warrant. The time spent in jail cost him his job and forced him to drop out of junior college. Also, the National Guard called him to active duty after he missed weekend training.

Violation of plaintiffs' rights

The Center for Law in the Public Interest, a nonprofit legal firm, filed a class-action suit against the city of Los Angeles, which operates the system, on behalf of Jones and four other people who had been falsely arrested — some of them 10 or more times. The suit charged that the city's Automated Wants and Warrants System (AWWS) violated the plaintiffs' constitutional and civil rights.

Last month, in a precedent-setting case, the Los Angeles Superior Court approved a settlement that requires the city to adopt policy and procedural changes in the AWWS.

"This is the first time this kind of settlement has been reached, despite the fact that computerized warrant systems are a problem that is being increasingly recognized around the country," said Joel Reynolds, a staff attorney for the firm.

In New Orleans, the police department's computerized crime system is also facing a legal test. The American Civil Liberties Union (ACLU) has filed a class-action suit charging the city of New Orleans and Jefferson Parish, La., with falsely arresting several hundred people because of computer programming errors [CW, March 21, 1983].

A settlement in that case is still pending, according to Martha Kegel, executive director of the ACLU's Louisiana affiliate, who said she was encouraged by the Los Angeles court's finding.

Stricter criteria required

The Los Angeles settlement requires the Los Angeles Police Department to use stricter criteria when matching a suspect to a computerized warrant. The system uses a complicated mathematical formula whereby a certain percentage of weighted descriptions, such as license number, hair color and address, must match in order to have a "hit." The percentage required for a hit has now been increased from 62% to 72% — a software change that should significantly lessen the chance of an accidental arrest, according to lawyers for both parties in the suit.

The settlement also requires police to search all available manual records before jailing a person who claims to have been falsely arrested, rather than simply relying on what the computer tells them. Warrants involved in a wrongful hit must be purged from the AWWS until new information is added to enhance their reliability.

William Jones, the man who was falsely arrested, won a $5,000 settlement from the city. The four other plaintiffs received a total of $32,500.

The suit, filed in 1980, was not intended to force the city to shut down the computer system, Reynolds said. "I think the focus of the lawsuit from the outset was trying to impose certain safeguards on the use of the computer system rather than to eliminate use of it entirely."

Byron Boeckman, a Los Angeles deputy attorney, said the city chose to negotiate a settlement to the suit rather than fight it in the courtroom.

Corrections needed in the system

"The lawsuit pointed out to us that there were some corrections which needed to be made in the system, and we decided to find out what those corrections were and then make them," Boeckman said.

He said the city has no statistics on the number of false arrests resulting from the computer system. The Center for Law in the Public Interest put the number at about 2,000.

One key improvement made by the city, Boeckman noted, was the installation last year of the Emergency Communications, Command and Control System (ECCS) [CW, March 21, 1983]. The communications system, based on four Digital Equipment Corp. PDP-11/70 and two PDP-11/34 minis, enables patrol cars equipped with E-Systems, Inc. mobile digital terminals to make on-line queries to AWWS.

With ECCS, a police officer can obtain a detailed printout of a particular warrant. In the past, Boeckman said, suspects were often hauled to a local police station until a copy of the warrant was sent by telex from another station.

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Recovery plan rescues USPS data net

The fire at USPS headquarters

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Postal Service (USPS) was able to restore its data communications network in 36 hours after a spectacular four-alarm fire Oct. 15 at its headquarters building here, said Chuck Kernan, assistant postmaster general for information resources management.

Kernan, in an interview, said that a prepared disaster recovery plan and around-the-clock work by a team of 12 to 15 persons from the staff and communications vendors enabled USPS to replicate its telecommunications node in temporary offices nearby. The internal administrative network links six data centers to 350 locations through dedicated circuits.

Vendors assisting with the data communications recovery included NCR Comten, Inc. of St. Paul, Minn., for front-end communications processors; Dynatech Data Systems of Springfield, Va., for a large electronic matrix switch, test equipment and interfaces; Rixon, Inc. of Silver Spring, Md., for new modems; Racal-Milgo, Inc. of Fort Lauderdale, Fla., for servicing salvaged modems; and AT&T and the Chesapeake and Potomac Telephone Co.

Mainframes not involved

Because the USPS computer center is located in Raleigh, N.C., its mainframe computers were not involved in the fire, Kernan explained.

He explained that although USPS was well prepared for recovery of its telecommunications network, it was not prepared for the damage done to the diskettes used on the 1,200 desktop personal computers at the headquarters.

Many end users had failed to make backup copies or to put backup copies in secure places, Kernan said, so USPS workers and contractors were locating smoke- and soot-damaged diskettes, cleaning them and making fresh copies for users. He said that even diskettes kept inside desks, flip files and filing cabinets were contaminated with fine grit from the fire.

USPS is also exploring methods to salvage diskettes that were warped by the fire. About 4,000 user diskettes have been discovered so far, and a total of 10,000 replacement diskettes have been ordered, Kernan noted.

He added that the 1,200 personal computers are being cleaned, certified as operational and returned to users. Working on the microcomputer and diskette recovery project are Blackmon Mooring Steamatic Catastrophy, Inc. of Fort Worth, Texas, and Office Technology Plus, the federal government's microcomputer store.

Ongoing recovery projects

Other ongoing disaster recovery projects, Kernan said, include servicing and replacing office automation equipment and replacing the IBM 370/158 computer used with an IBM optical-character reader for a forms-reading application.

The fire in the 11-story building at L'Enfant Plaza was described as one of the largest ever fought in the District of Columbia, causing an estimated $100 million in damage. Fire department officials speculated that the fire spread quickly because the building lacks a sprinkler system.

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Seta conference set for Nov. 5-7

ORLANDO, Fla. — The Southeastern Telecommunications Association (Seta) has announced that its 1984 annual conference, "Balancing Technology and Management," wil be held Nov. 5-7 at the Orlando Hyatt Hotel here.

The conference will feature Robert Wiggins, president of Paradyne Corp., as the keynote speaker, as well as exhibitors displaying telecommunications equipment and services and sessions covering the industry.

Session subjects will include cellular radio, coordinating in a multivendor environment, teleconferencing, regulatory update and network enhancements, the sponsors said.

Seta is an organization of some 300 companies devoted to the development and enhancement of telecommunications management. Registration for the conference, which is open to the public, costs $275. More information is available from Seta, P.O. Box 901, Richmond, Va. 23207.

Computerized stock trading subject of SEC caveat

Commission warns investors on using delayed quotations, says problems may worsen

By James Connolly
CW Staff

WASHINGTON, D.C. — The U.S. Securities and Exchange Commission (SEC) has warned the brokerage industry that more safeguards are needed to protect investors who use computers to buy and sell stocks.

The SEC, in an advisory to operators of computerized brokerage systems this month, issued guidelines for handling electronic ordering and execution and said more guidelines can be expected as the human involvement at brokerages decreases.

The advisory by SEC Assistant Director Michael J. Simon was directed at the increasing number of banks, on-line data base services and brokers operating systems where investors use personal computers to trade stocks.

"As a general matter, the commission believes that computer brokerage systems may benefit investors by increasing the efficiency of the order entry and execution process. As the commission has reviewed the systems being developed or operated, however, several issues have arisen which the commission believes should be highlighted," the advisory said.

The primary SEC target was the unavailability of current quotations, as customers opt for less expensive delayed quotations during normal trading hours.

"Concerns do arise when investors rely entirely on delayed information during normal market hours. In that event, investment decisions may be effectuated by sending an order execution through the computer brokerage system without knowing whether any unusual price changes have occurred in a security during the delay period," the SEC said.

The commission noted that the delay will have its greatest impact when the next generation of services eliminates the human element — the broker who reads the customer's request on a printout, checks to ensure that the quoted price is comparable to the current price and then executes the order.

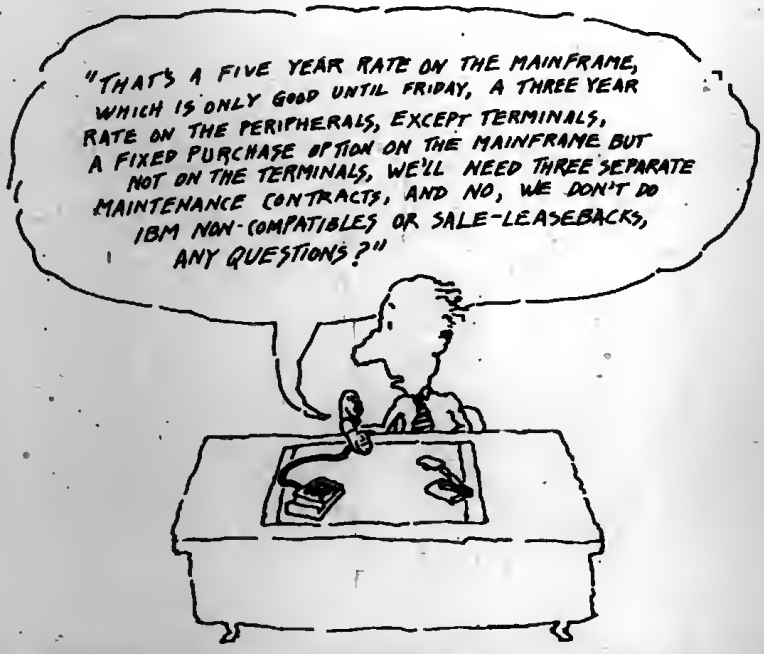
The SEC suggested a computerized override to detect significant differences in prices, a bar on market-hour trading except for customers with current information or a provision for the system to provide investors with current prices only as a final step before executing an order.

Other concerns addressed by the SEC were the need for documentation and surveillance of trading activity, the qualifications of customers to make risky investments and the need for system safeguards to protect customer account information.

Some computer brokerage systems already address most of the SEC's concerns, according to Frank Faeth, manager of Chemical Bank's Investment Access Project, a project to provide the bank's Pronto home-banking customers brokerage services.

"There is protection. The system itself will not accept a price that is 20% different from the current price," said Faeth, noting that Chemical Bank's service will use manual execution when offered in January.

But Faeth and other observers noted that the SEC advisory raises new questions. Faeth said it does not address the possibility that a quotation service may post the wrong prices, which could be costly to a customer.



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Federal OA plans topic of meeting

WASHINGTON, D.C. — Office automation plans and strategies of key federal government agencies will be presented during a special executive-level Office Automation Program Directors Roundtable, at this year's Federal Office Automation Conference (Foac), Nov. 7, at the Washington Convention Center here.

Foac's exposition and conference includes a six-track main program Nov. 7-8 as well as eight all-day seminars on Nov. 6. The theme of the conference is "Office Automation: Getting Down to Business."

According to Chuck Gularson, Foac industry chairman and round table moderator, the purpose of the round table will be to facilitate the exchange of information among government agency executives who are setting OA and information management policies.

Highlights of the round table agenda are:

- Policy statements from the General Service Administration, the Office of Management and Budget and the National Bureau of Standards.
- OA plans and strategies of two Fortune 500 companies: Exxon Corp. and ITT Corp.
- Planning and implementation strategies in major agencies.

More information is available from Morris Edwards, Federal Office Automation Conference, P.O. Box N, Wayland, Mass. 01778.

AT&T service to nearly double capacity of T-1 circuits

CW AT NDC

By Phil Hirsch
CW Washington Bureau

MIAMI — A service that transmits 44 digital voice channels, instead of the usual 24, on a standard 1.5M bit/sec T-1 channel is about to be tariffed by AT&T Communications, a company official said here last week.

Known officially as M-44, the offering will be a part of AT&T's Accunet T-1.5 service, W. A. France explained at a telecommunications seminar held here by International Data Corp., a Framingham, Mass.-based market research firm. France, who is Accunet T-1.5 service manager, said M-44 will enable users to reduce their transmission costs 15% to 30%.

The telephone company, he reported, has asked the Federal Communications Commission to let the M-44 tariff become effective 45 days after it is filed; AT&T is now waiting for a response. If the commission grants the request, France added, the M-44 tariff will be filed immediately.

M-44 will enhance [this network-provided multiplexing/demultiplexing feature] by nearly doubling the number of circuits that can share a T-1 channel.

Before the end of this year, he reported, AT&T also plans to tariff a customer-controlled reconfiguration capability. It will enable a user — with the help of a nonintelligent terminal and a simple set of commands — to reroute individual Accunet T-1.5 channels at will.

Several more improvements are coming, he added. At the moment, France said, Accunet T-1.5 service is a point-to-point offering that runs between customer premises. It can accommodate voice, data, facsimile and video in digital form.

The first major upgrade is scheduled to occur next month, when AT&T plans to add a network-provided multiplexing/demultiplexing feature. A user will be able to terminate a 1.5M bit/sec Accunet channel in a multiplexer located at a local or remote AT&T central office; from there, the phone company will fan out the individual channels to different final destinations that can be either close to the central office or far from it.

M-44 will enhance this capability by nearly doubling the number of circuits that can share a T-1 channel; it will also reduce a typical user's transmission costs between 15% and 30% for the same number of individual analog voice circuits, France said.

Not only will customer-controlled reconfiguration allow the fan-out pattern to be altered at will by the user, but it will also enable the user to reroute the T-1 channel, France claimed. A typical example, he explained, would be a company with an office headquarters and a computer center in different parts of the same city. Customer-controlled configuration would permit the 1.5M bit/sec channel to be connected to headquarters during the day and to the computer center at night.

France also highlighted what he said are other Accunet T-1.5 improvements in the offing, including the following:

- Automatic protection capability — a secondary circuit that can be turned on if the primary one fails. To provide added protection, the secondary will follow a different physical route than the primary.
- Extension of Accunet service into Canada in the first quarter of 1985. This is intended to be the first step in deployment of an international version of the service.
- Implementation next Jan. 1 of a signaling system, which reportedly will reduce the user's network testing expense.

The target customer for Accunet T-1.5 service is a large company now using Digital Dataphone Service (DDS) and/or mutiple individual private lines. Although the present Accunet service accommodates 24 digital voice channels, it can be less expensive than DDS, depending on distance, if the user has as few as six voice channels, France said.

He added that the M-24 multiplexing service that AT&T plans to launch next month will be priced at $400/mo per multiplexer location. France declined to say what M-44 and customer-controlled reconfiguration will cost, but other sources revealed that the former offering — which requires a second multiplexer — will cost $500/mo per multiplexer location. Customer-controlled reconfiguration reportedly will be priced at $375/port per month.

Currently, France said, there is a nine- to 12-month wait for Accunet T-1.5 channels; he hopes to get this down to six months by 1985.

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Wangnet users relate experiences, long-term plans

Despite initial growing pains, Wangnet local-area nets up and running

CW AT WANG USERS MEET

By John Desmond
CW Staff

BOSTON — Several users of the Wang Laboratories, Inc. Wangnet broadband local-area network interviewed at an International Society of Wang users meeting here last week described plans to use Wangnet to communicate to non-Wang equipment.

Richard Raybould, director of data processing for the state of Utah, uses Wangnet to connect 350 workstations in two buildings — the state office building and archive building — to one of four Wang VS 100 systems. He plans to add a third building, the state capitol, to Wangnet as well.

Although Raybould's DP shop has two Amdahl Corp. mainframes and an IBM 3081 mainframe, only Wang equipment is connected on Wangnet at present, Raybould said. But he does have plans to communicate with the mainframe data bases over Wangnet, and he said he is waiting for the company to ship the appropriate product.

Wangnet may catch on more in Utah, because the Utah Building Board has established Wangnet as a standard in all new state office buildings, Raybould said. As for performance, "We had initial growing pains, mainly because the Wang technician who installed the network didn't understand the importance of getting all the components [synchronized]. Once they got their act together, everything went smoothly," Raybould said. The system's installation was not disruptive, and the cost of installation was 10% to 20% over estimates, which satisfied Raybould.

David Horak, chief of the Systems Operations Unit in the Antitrust Division of the U.S. Department of Justice, said the department is using Wangnet at two sites to connect workstations to VS 100 systems. Wangnet was chosen because of its flexibility for adding workstations and peripherals and because installing coaxial cable as an alternative would have been difficult in his offices, Horak said.

'Maximum flexibility'

"With Wangnet, we can run cable all around the office and have maximum flexibility for plugging stuff in and out," Horak said. His office has some 80 devices on the floor, so he would need 80 pairs of dual coaxial cable to connect each one without Wangnet, he said. Although the department had some initial problems bringing the Wangnet up, specifically in the network multiplexers, the performance has been satisfactory since then, Horak said.

If plans go through for a consolidation of Justice Department offices in Washington, D.C., Horak said, other local-area networks will be considered. "Our hope is to install our [network] with the Justice Department data center," Horak said. Given the department's experience with Wang, he said, Wangnet would be considered for the connection at that time.

Michael Greco, manager of office systems for General Foods Corp. of White Plains, N.Y., said his shop is about to become a multivendor user of Wangnet. Within three weeks, General Foods expects delivery of a Wangnet system that will allow Wang workstations through a Wang OIS processor to access data bases on IBM 3081 and 3033 mainframes, Greco said.

The company chose Wangnet because a decision was made early in planning that a broadband net was required to integrate voice, data, text and images. "We looked at what was available," Greco said, and the firm felt only Wangnet was advanced enough for its needs. "It is a very effective way to link all departments together," Greco said of Wangnet.

Wang will provide software to run on the OIS host, said to allow a Wang terminal to emulate an IBM 3278 terminal to gain access to the IBM mainframe. The company hopes to use Wang word processors to access IBM's Professional Office System software as well. "We want to give our whole population total access to our information universe," Greco said. "It should be transparent to them and very simple." The company had an advantage in that Wangnet is being installed in a new building; disruption was minimal.

One of the largest Wang installations in the world, the Department of Social Security of Australia, centered in Canberra, Australia, chose not to use Wangnet to link up its ambitious nationwide computer network, nicknamed Stratplan.

N. J. Tanzen, deputy director general of the department, said, "Wangnet, as I understand it, is basically to allow Wang [systems] to talk to Wang [systems]. We needed the Wang [systems] to talk to the mainframes."

The Australian Department of Social Security spends some 30% of the total national budget and processes some 70 million checks per year in the country with a population of 15 million, Tanzen said. The organization has 200 offices nationwide, some in remote locations. All of its mainframes are Amdahl 5800 series, and the department has some 300 Wang VS systems and some 7,000 Wang color workstations linked to them, Tanzen said.

One of the department's goals is to be able to download software from mainframe to minicomputer to workstation, something they are relying on IBM's Systems Network Architecture to do. "That's not what Wangnet is trying to do," Tanzen said.

Initial problems

John Mraz, manager of specifications for technical documents at Ethicon, Inc. of Somerville, N.J., manufacturers of surgical sutures and a subsidiary of Johnson & Johnson, Inc., said his department had initial problems when bringing up Wangnet.

He qualified the experience by saying that Johnson & Johnson was one of 20 sites nationwide selected to pioneer Wangnet.

Mraz's department added the equivalent of 200,000 pages of text to the Wang VS 100 processor when they went on-line to Wangnet. "We experienced some down time and some slow response times as a result," Mraz said. At times, it would take minutes for a screen to come up, he said. But since the early stages, the problem has been resolved, and the company plans to move forward with plans to connect five U.S. plants with Remote Wangnet, a distributed processing system for connecting Wang equipment.

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HW

GOEKEN from page 15

the FCC said we needed unbiased people to come in and say they needed the service. As it turned out, those people said, "We don't want it for two-way radio; this is what we need." So we modified the MCI system to meet corporate telecommunications requirements.

In 1968, the case was closed with the FCC, and we were looking to expand the system on a nationwide basis. To get the company in financial condition to do that, I hired Bill McGowan to raise the financing. We formed what is basically now the MCI network. We had 17 MCI operating companies; and each company was independent and financed by different individuals. MCI Communications acted as the nucleus for marketing and engineering standards. Once we found out that the FCC was looking for competition for the Bell system, we consolidated all of these companies into one nationwide network in 1971.

Q Why did you leave MCI?

The whole purpose of MCI was to open up new markets, come up with new services. As new technology evolved, it had to be incorporated into the existing telephone network, so you had a mixture of old, obsolete technology mixed in with new, more efficient technology. MCI was coming in with the state of the art of the '70s, coming up with a brand-new network with the ability to sell bandwidth rather than individual circuits.

"I just wish you had a thousand lives to live because you could do so much."

The financial people, [however], wanted to go after the long-distance telephone user, where I wanted to open up services like air-to-ground telephone service and specialize in specific areas to take advantage of a network built with the latest technology.

Q What was your relationship to Satellite Business Systems?

At one time, MCI thought that satellites would be ideal for long-haul telecommunications services. To try to make MCI into a more uniform company, in 1969, we formed a company with Comsat [Communications Satellite Corp.] and [Lockheed Corp.] called CML. With the legal battles MCI was facing, we sold CML to IBM, Aetna Life and Casualty Co. and Comsat. They switched the name to SBS.

Q What did you do when you left MCI?

I resigned from MCI in 1974 to start Goeken Communications, Inc. The first company we started under Goeken Communications was the Business Telecommunications Corp. [BTC]. This company has its own microwave system from Chicago to Milwaukee and has been expanding ever since it started; it now earns 40% on the bottom line.

The next company we formed was Goeken Systems, Inc., which designed and installed the FTD Mercury network, which today is the largest computer network, supporting 10,000 on-line terminals.

Q When did you start Airfone?

Airfone was started in 1975. In 1981, Western Union came in as a 50% partner when we were still doing the preliminary engineering and didn't have an FCC license, [Federal Aviation Administration] approval or any airlines under contract. It was strictly a start-up company.

Q What was the hardest thing to do in putting Airfone together?

There was no one easy thing to do. Like any new business, one thing was the money. But we also had to obtain regulatory approvals from two government agencies and had to design, develop and get into production the equipment needed.

Q Do you have any regrets? Do you wish you had seen any of these companies through further?

With MCI, we recognized that there were two avenues we could go down. Once you pick one, you can never prove that the other would have been more profitable. But MCI had, in my mind, a golden opportunity to open up new avenues of communications that the Bell system couldn't compete with.

There is no way to say if it would have been better or worse, but I would have liked to have had the opportunity to see. But I left MCI and ended up doing most of the stuff I wanted to anyway.

Q Given the AT&T divestiture, do you think there are more opportunities for new communications services or less?

Divestiture should, theoretically, open new opportunities for new areas. From a practical aspect, given the resources of AT&T, it's hard for a new company to compete. Divesting long lines from the local loops does, however, open new areas. The next battleground will be local distribution. I think it's a fantastic market.

Q Can you share with us any of your future plans?

For now, the main thing is to keep Airfone up and operating, to make sure it is a success. I have another company I'm interested in, called Aid, which would market a wrist-watch-type thing that could summon help for people that need it. As technology advances, things become possible that you couldn't do a short while ago. I just wish you had a thousand lives to live because you could do so much.

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Training prescribed for treating OA user phobias

CW AT WANG USERS MEET

By John Desmond
CW Staff

BOSTON — One of the first things Wes Gibson does when he begins an end-user training session is hand a screwdriver to his charges and tell them to disassemble the computer. "That way we get all the gremlins out," Gibson said last week at a meeting of the International Society of Wang Laboratories, Inc. here.

The fear of computers can adversely affect the success of office automation implementation efforts, he said, and training should recognize that different users have different requirements for the system.

The most commonly overlooked process in office automation is the training required to support and sustain the new automated environment, said Gibson, a senior vice-president with Computer Dynamics, Inc. A viable training program is mandatory for an organization to achieve maximum productivity from an OA system, he said.

He defined four types of learners. The first is the rigid, inhibited type of person confronted with a complex situation, similar to a person who walks into a computer store and is confronted "with 21 buzzwords," Gibson said. "I think they [the vendors] want to intimidate the user so much he won't ask any questions," Gibson said. Such learners have trouble getting started unless the information is simplified, Gibson said.

The second type is the undisciplined learner. This person performs better autonomously rather than by following directions and often requires special training, Gibson said.

The third type of user possesses both acceptance and anxiety. Such types see criticisms as rejections of their worth as individuals. They are more comfortable in passive learning situations.

"Did you ever see a classroom of Marines in front of CPUs?" Gibson asked. "They lock up. They're afraid to touch a key because they're afraid a gremlin will come out and get them." This type of fear must be allayed by a prerequisite, such as tearing down the computer with a screwdriver, Gibson said.

The last type is the creative and open learner, who is not frightened when errors are made and who persists in completing a task out of an interest in conquering the problem. How are users trained? Gibson cited a recent Exxon Corp. survey that showed 33% of users are trained manually, 28% are trained on the job, 23% are trained by vendors, 22% are trained by coworkers and 12% are self-taught. (The overlap was caused by some trained by more than one method.) Gibson noted that only 3% of the Exxon respondents said they were afraid of computers. "We're not being honest with ourselves," he said.

Computer-based training typically takes four times longer than classroom training, Gibson said. A session that takes 2½ days in a classroom may take 60 to 80 hours of self-teaching to duplicate, he added.

The most important aspect of any training program is hands-on exposure, Gibson said. "If there are no hands-on applications, you're wasting your time."

For a successful OA training program, Gibson advised the following:

- Identify desired outcomes with specific objectives.
- Identify the level and type of training required.
- Start with classroom training.

"OA is not just the installation of equipment," he said. "Training is paramount."

One user in the audience said his company recently bought a Wang VT 100 system and installed it in 89 U.S. sites. But then, the user said, management cut the budget for training. Gibson said, "Management has to accept the fact that [it] can put in as much hardware as [it] wants, but the system will not run until people can operate it. The company will lose money unless the system is used to its full effectiveness."

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Methods for DP growth work for OA as well: manager

CW AT WANG USERS MEET

By John Desmond
CW Staff

BOSTON — Saying that the dichotomy between data processing and office automation should not exist, Finbar Donovan of the Allied Irish Banks Group in Ireland said last week that the same approaches used to manage DP growth can be used to manage the transition from one stage of OA to the next.

Donovan, assistant general manager of group technology for the Irish Banks, reminded his audience at a meeting of the International Society of Wang (Laboratories, Inc.) Users here that the four stages of DP growth in a corporation are:

- Initiation.
- Contagion.
- Control.
- Integration.

As computers are introduced into an organization and gain acceptance and use, management realizes a need for control, management and planning. This is a theory first outlined by Prof. Richard L. Nolan of the Harvard Business School in 1974. As the different stages are reached, the responsibility for managing DP is pushed higher in the organization, Donovan said.

In the initiation stage of DP in an organization, most functions were related to accounting. DP staff was, for the most part, reporting to senior finance officers. The initiation phase of OA was similar in that priorities had to be set for serving many users, but OA was unlike DP in that relationships were closer to end users. "DP had been a staff support function, whereas OA can be regarded as a line function," Donovan said.

From the end-user point of view, the transition from DP to OA has been like changing from wholesale to retail, Donovan advised. "Acceptance by the end user has to be the objective rather than imposition of new systems," he suggested.

The contagion stage of DP growth is marked by a proliferation of independent applications. End users gained their first hands-on experiences with on-line, real-time processing and time-sharing. But cost overruns and delays were common, and management became disillusioned at ballooning DP budgets. Growing demand led to capacity problems, and incompatible equipment was being introduced into different parts of the organization, Donovan said.

"I believe many operations have now reached the contagion stage in OA," Donovan said. More comprehensive applications are now being supported with a greater number of OA functions. Donovan said this stage requires a broad perspective on the business environment and an eye towards integrating systems.

DP has a role in OA as well. "The DP function cannot be totally ignored by the end user," especially since much of the relevant data is already stored by DP. The DP department should be available to evaluate vendors, for testing and networking and for support and training. End users left on their own will be unable to identify problems, will lack adequate advance preparation, will duplicate files and will buy incompatible equipment, Donovan suggested.

To manage the contagion stage of OA growth, organizations need a system design catering to clerical staff, secretaries, professionals and management. OA should free the professional from drudgery and enhance the quality of work. Justifying the costs of OA to management or "putting a value on timely, pertinent information" is difficult, Donovan said.

Donovan said, "The time has come for an information-handling infrastructure which gives each office worker the capability of accessing electronic files, the ability to handle text automatically and to communicate electronically with fellow workers."

Moratorium on development

In the control stage of DP development, management imposed a sort of moratorium on development. A backlog of applications built up, and departments began to buy their own minicomputers and software to keep up, Donovan said. Thus, the original DP shop was often "reduced to keeping old systems patched up," he said. With an overall system plan, this stage should be avoided in OA.

The integration stage was never really reached in DP; Nolan came out with a revised theory that added stages of data administration and maturity. Data administration referred to managing information as a corporate resource, while maturity is the "hoped-for utopia," Donovan said.

Donovan quoted one authority who listed six critical issues for OA:

- Maintain a human perspective in the office.
- Design meaningful, satisfying jobs.
- Create user-oriented systems, not equipment-oriented systems.
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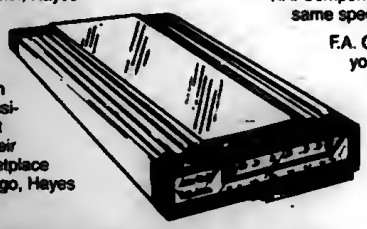

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Users balk at idea of single-vendor OA solutions

By Bryan Wilkins
CW Washington Bureau

DALLAS — The majority of top management users at a recent Intech '84 conference here voiced universal allegiance to the concept that they will not be forced to accept single-vendor solutions to their office automation plans.

Instead, they pleaded with Joseph DeBlasi, IBM's director of standards, for some direction to the company's product lines that will permit standardized interconnection routines for non-IBM. equipment.

DeBlasi opened the session with a statement supporting efforts now under way to produce universal standards following the International Standards Organization's Open System Interconnection (OSI) model.

On their own

Other vendors at the session, who are competing against IBM, also voiced support for universal interconnection and the standards work involving OSI, but iterated that they are having to take their own steps to link with the dominant force in the market — IBM.

Al Malinger, director of product strategy at Datapoint Corp., challenged DeBlasi on IBM's support for the OSI model, pointing out that the company's recent announcement of a network to link its new generation of personal computers follows a coaxial communications architecture and not the seven-layer OSI model.

DeBlasi responded that IBM's move with regard to the IBM Personal Computer network does not mean the company is not supporting standardization. "The market hasn't settled down as far as standards are concerned. Where's the market going? We are looking at a multiple approach," DeBlasi said.

DeBlasi said that in the future, vendors will have to make OSI a network requirement in their products. He pointed out that IBM's proprietary Systems Network Architecture (SNA), which links differing IBM data processing products together, is capable of connection to OSI because they have a similar layered structure.

DeBlasi said IBM is currently performing some experiments in Europe that are testing solutions to an OSI-SNA link. He predicted that an agreement on standards for the top two layers of the OSI model will not be ready until the end of the 1980s.

Other vendors in attendance at the session pointed to their own efforts to support a multivendor environment in the face of increased customer impatience at delays in finding a solution to incompatibilities.

Data General Corp.'s director of marketing for information systems, Frank Pinto, said, "compatibility and connectability are absolute priorities [for DG]. . . . DG has always recognized the imperative of conforming to industry and IBM standards."

Pinto noted that DG has attempted to provide its users with an IBM connection through a joint agreement with Cullinet Software, Inc. and its Information Data Base. A similar agreement was announced recently between Digital Equipment Corp. and Cullinet. Both agreements would provide users with a non-IBM link to IBM's SNA environment.

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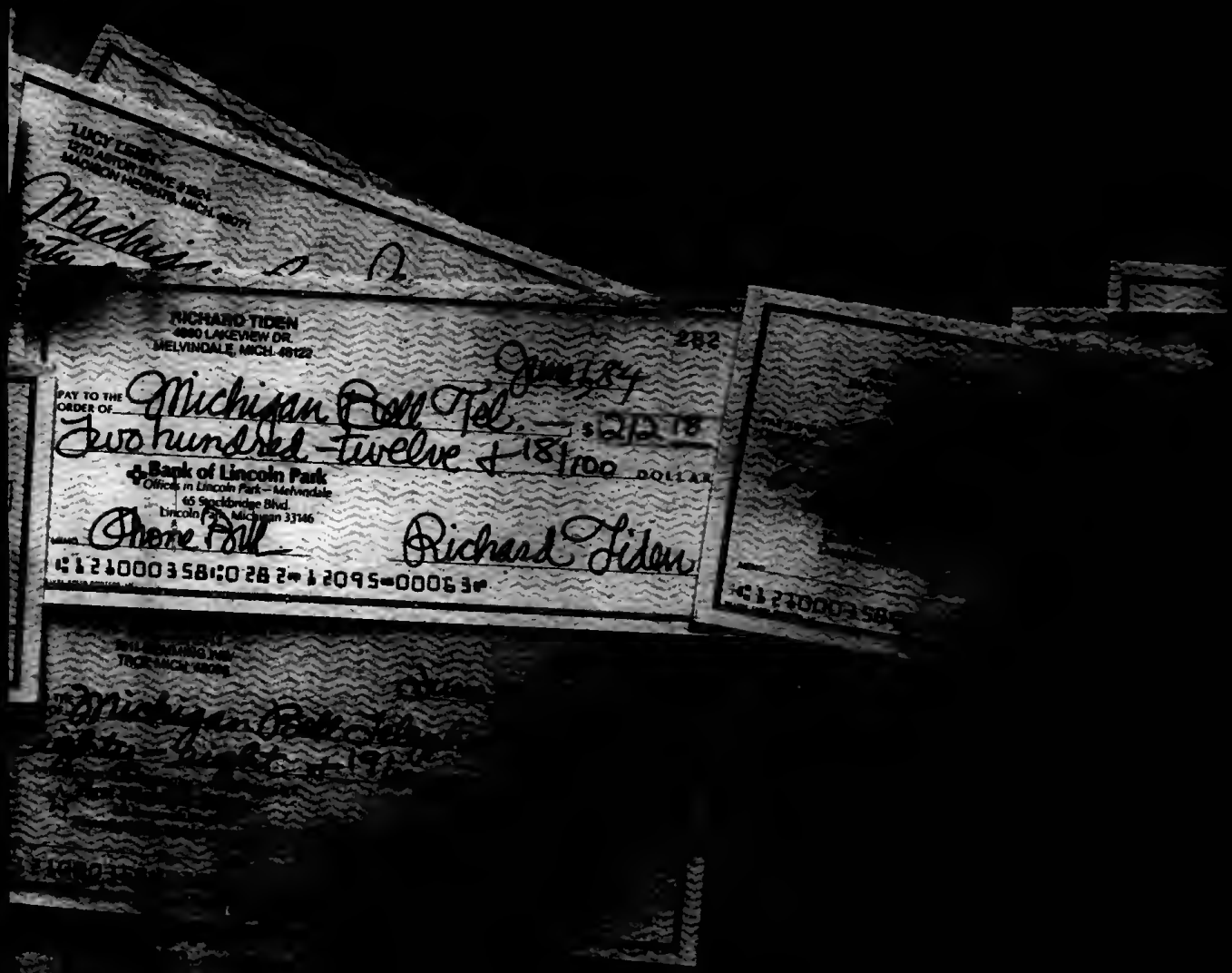
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NEWS

Hacker shows Brits how it's done

Teen's alleged access of Nasa computer spurs UK invite

By Maura McEnaney
CW Staff

HUNTSVILLE, Ala. — A 16-year-old computer hacker accused of breaking into a National Aeronautics and Space Administration (Nasa) computer system this summer, has found that crime sometimes pays. In this case, it came in the form of a free trip to London to show them how it's done.

When staffers on the *London Daily Star* saw reports of how the U.S. Federal Bureau of Investigation seized computer equipment from Robert Grumbles and three other area teenagers after they had gained access to a computer at the Nasa Marshall Space Flight Center here [CW, July 23], the newspaper thought it would give Grumbles a shot at the British computer network. The newspaper invited Grumbles and his parents to London as part of a story to demonstrate the need for computer security in England.

According to Lenora Grumbles, the teen's mother, as part of his week in London, Grumbles was invited to a local computer store to demonstrate how easy gaining access to computer systems can be.

Grumbles found a hacker's bulletin board containing passwords and access numbers of British users, including the University of London and Barclays Bank.

Onlookers in the store were surprised when Grumbles not only showed them how to write the sequential dialing program he and his friends used on the Nasa computer system, but also when he uncovered an active hackers' underground.

"There's a big underground of information over there," Grumbles told *Computerworld*. He said he easily found a hacker's "very large" bulletin board containing passwords and access numbers of British computer users, including the University of London and Barclays Bank. More than 400 users were accessing the bulletin board that originated from an IBM Personal Computer XT or Personal Computer AT with about 50M bytes of online storage, Grumbles said.

The largest hacker's bulletin board Grumbles could recall in the U.S. had about 150 users, he said. The British hacker's bulletin board also revealed that passwords and access numbers in England are not changed as frequently as they are in the U.S., Grumbles said.

Asked if her son actually accessed any of the computer systems listed in the hacker's bulletin board, Grumbles' mother said, "I stood there over his shoulder and made sure he didn't."

Bank finds growth puts squeeze on MIS department

By Charles Babcock
CW New York Bureau

NEW YORK — Four years ago, when the Bank Leumi Trust Co. of New York acquired the 13 branches of Bankers Trust Co. it discovered some problems in its MIS department.

Until then, Bank Leumi had been a quiet subsidiary of Israel's largest bank. It had a dozen branches in New York with a base of Jewish depositors and a commercial lending practice to the New York fur, jewelry and garment industries.

With the acquisition of the Bankers Trust offices, it doubled in size to become the 74th largest consumer bank in the country, and its MIS department was not ready for the growth.

The department had purchased general ledger software before it had a mainframe on which it could run. The bank was an NCR Corp. installation, but its NCR system could not handle the transaction processing of 25 branches.

"It was not a very good conversion plan. . . . When a terminal went down at a branch bank, we'd call the telephone company to ask what was wrong. We had no internal diagnostic capability," said Robert E. Woodrow, senior vice-president for MIS services, who joined the bank two years ago.

And while Bank Leumi is still lagging behind the more aggressive money center banks, it is beginning to catch up. It is hoping to put its data processing shop in order within a year so it can move beyond transaction processing into tactical information gathering and strategic planning, bank officials said.

Uniform environment

Part of catching up is moving away from a mixed environment into a more uniform one. "I convinced management to change completely to IBM," Woodrow said, although he acknowledged that the task was made easier by the fact that the bank's president, David Novick, had overseen IBM's largest installation in Israel at Bank Leumi le Israel BM.

Part of the bank's transition will involve establishing an 18,000-sq-ft data processing center to consolidate operations that are now scattered over three locations.

The upgrade will help ensure that Bank Leumi does not risk losing customers because of outmoded equipment, according to Woodrow. When a customer cannot find out his balance because the computer is down, he tends to become annoyed, Woodrow noted.

Another side to it, however, is the need for quick information processing to stay competitive, he said.

"A bank's profit results from the narrow spread between the rates it pays for the money it takes in and the rates it gets lending it out," noted Arthur C. Johnson, assistant secretary and head of microcomputer training at the bank.

While the bank's minis and mainframes do accounting and transaction processing, an assortment of IBM and Apple Computer, Inc. personal computers help the bank monitor its operations.

Eliot S. Robinson, senior vice-president for asset-based lending, said his office keeps track of $100 million in loans on an IBM Personal Computer XT. The bank lends money to "fast-growing businesses that pledge us their customer receivables."

The bank is willing to advance 80% of a firm's receivables minus the loans already outstanding. So a firm's credit line may need to be calculated and recalculated at short notice as the figures change, Robinson said.

Over the past two years, Herman P. Strauss, assistant vice-president, has seen the number of department reports grow from 35 to 80, but he still has only two staff people to produce them.

Standardizing reports on, first, an Apple III and then on a Personal Computer XT has allowed the staff to keep up.

"When money comes into the bank, it gets all mixed together," Strauss said, but his staff is able to report which branches are generating the most deposits, what the overall loan portfolio is yielding and what the bank's cost of funds is.

Because of uses like these, the bank has expanded its number of micros from two in 1982 to 60 in 1984.

Three people on the 83-person MIS staff are devoted to helping micro users, and that commitment "relieves some of the pressure on the mainframes," Johnson said.

"The key to a bank's survival will be the quality of its data processing, its information," Woodrow said.

Bank holds mixed bag of systems

Bank Leumi Trust Co. recently decided to supplement its IBM 4341 with an IBM 4381, the top of the line in the 4300 series, Robert E. Woodrow, senior vice-president for MIS services, said he had also considered an IBM 3083, but the 4381 won out on both lower cost and the prospect that IBM may upgrade the model to 3083 sooner.

The 4381 will run all the bank's transactional systems, including deposits, loans, investments, expenses and special applications, such as the general ledger program. The 4341 will be used for program development and as backup for the 4381, Woodrow said.

Two DEC VAX-11/780s that replaced two VAX-11/45s 15 months ago will continue to be used for the integrated money-transfer system that connects on-line [illegible] between the bank and overseas banks, other New York banks and the Federal Reserve System, Woodrow said.

Foreign exchange [illegible] are now done through a time-sharing service, but are scheduled to be run on an IBM System/36 beginning early in 1985.

Bank Leumi will continue to use its NCR Corp. 8675 and 8665 processors for check processing transactions.

"We decided to keep check processing on NCR because of the investment made in software and equipment," according to Woodrow.

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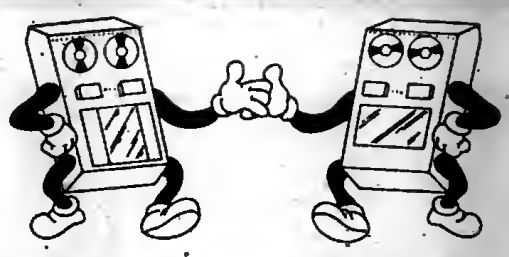

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Data base provides instant credit reports to lenders

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — For 350 businesses here that make daily decisions whether to extend credit to customers, on-line information on the credit worthiness and the repayment record of a borrower is now available.

The National Association of Credit Managers' (NACM) National Capital Region recently concluded an agreement with TRW, Inc.'s Information Services Division for instant access to TRW's credit data base, which maintains the largest on-line collection of data on American consumers — 120 million of them — as wall as the credit histories of eight million businesses.

Members of the NACM's National Capital Region can now obtain a comprehensive file of information on the past and current financial health of a firm, before large debt losses occur, as well as use the data base as a financial management tool to accelerate cash flow and expand sales.

The market for business credit reporting is expanding at an 8% annual rate, according to Link Resources, Inc., a New York-based market research firm and subsidiary of International Data Corp. The firm estimates that the market for public-access data bases produced more than $1 billion in revenues in 1982 and is likely to reach $3 billion by 1987.

The largest segment of this market is business information, which accounts for more than 75% of the data base revenues, according to Link. This includes financial, economic and credit information services, as well as legal, medical, agricultural and real estate data bases.

According to Paul Palermo, vice-president of TRW's information processing services, a customer's system can link directly into the credit history data base and appears as another on-line terminal to TRW's system.

Software applications that manipulate the TRW data base permit users to perform selective tasks with the data. Among them are Prescreen, which allows TRW data base users to prequalify potential customers for credit lines, aimed at users such as banks that send direct mail solicitations to individuals who hava been screened as acceptable credit risks.

A second software application is called Quest, which provides TRW customers with periodic reviews and reports on the status of current consumer credit holders.

Additional features

The Alert and Signal programs notify TRW customers when the credit standing of a credit holder deteriorates. Other features available from the data base include keeping track of the number of inquiries received from TRW customers for a particular credit history as well as the automatic handling of billing for each credit report requested.

Update and Monitor modules review and keep track of a subject's existing account payment practices and automatically produce business credit reports according to criteria selected by the contributor. The package of applications options are generally known as Asset Control Techniques.

Generally, credit executives receive a Business Profile Report that summarizes how a company has paid its bills for the last six months. The reports range in cost from $4.50 to $5.50 each. The reports detail dates of each credit trade, payment terms, amount of credit extended and account balance.

Other services provided by TRW's Information Services Division include a Trade Line Industry Profile that compares the particular business credit record with that of the industry average, and a Composite Industry Profile that summarizes a firm's overall payment performance to suppliers in industry groups.

Finally, where possible, the Profile gives the business's bank identity as well as the firm's estimated annual sales, number of employees, estimated market share at that location and other ownership facts.

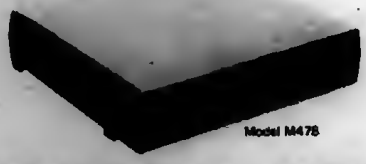
Upgrading the information in the data base is accomplished through the regular submission by TRW customers of the accounts receivable files on their customers. TRW obtains these files each month on magnetic tape. Tha tapes are then analyzed and edited by TRW before being entered into an update system that then transfers them into the credit and trade balance files.

The communications network linking the TRW customer to the data base is called Datalink and provides a turnaround time between three and 10 seconds. Datalink is composed of dedicated, leased communications lines operating as a virtual circuit packat switch, routing the data through a network of 29 intelligent nodes and 56 statistical multiplexers for two-way access between each of 72 cities and TRW's data center in Anaheim, Calif.

According to TRW, a total of 112 cities are linked to 18,000 teleprinters that can access the data base. The software located at these nodes establishes the most efficient transmission path for the data, whether satellite, microwave or private land lines.

The heart of the information service division is the Anaheim data center, where two IBM mainframes — an IBM 3033 and an IBM 3081 Model K — reside and hava recently been joined by an IBM 3084 Model Q.

Behind the processors are 192 disk drives containing the data base. They include 32 IBM 3350s, 24 IBM 3330s, 80 Control Data Corp. 33502 disk drives, 30 IBM 3420 tape drives, 100 IBM 3380 disk actuators and one IBM 3851 mass storage system.



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MIS dispersal ushers in smooth system automation

By Donna Raimondi
CW Staff

ANDOVER, Mass. — In 13 months, a telecommunications company here transformed its totally manual business and manufacturing processes to totally automated systems with nary a hitch.

Infinet, Inc. (formerly Intertel) produces modems, multiplexers, other communications products and network control and management information systems and services, said Tom Cormier, director of corporate MIS. Infinet's board of directors decided in 1983 that it wanted the company to capture a larger share of the communications market and that the company would have to automate in order to facilitate expansion, he said.

Until this time, Infinet had used service bureaus to handle some material requirements process (MRP) needs and payroll, said Nick Papantonis, vice-president of MIS and developer of Infinet's MIS plan. The company's order processing and business systems were manual and in-house, he said.

Two Digital Equipment Corp. VAX-11/780s running under DEC's VMS operating system now service 150 users, and a third VAX-11 will come on board next summer to take care of a growing waiting list, Cormier said.

Papantonis said the conversion was successful because "we distributed MIS in users groups and gave people the feeling it was their system," he said. Each section has an MIS manager to work on its particular problems or needs, he said.

The push toward MIS was internally driven, Papantonis said. "You need someone inside at the right level. That person must be able to get money and must be believable to the chief executive officer, the board of directors and the operating groups. With this, you have a commitment from the top."

Extensive homework

Extensive homework helps find the best system, he said. Papantonis talked to each vice-president to find out what his major areas of concern were and then decided on secondary needs and desires, he said. He attended seminars on hardware and software and visited several small companies that had just automated, he said. He talked to vendors and sat through many presentations over a period of several months, he added.

After all that, he came up with a three-year plan to implement the new system. So far, the company has spent less than the anticipated amount, Papantonis said. He had figured on $1.5 million for the first year and so far has spent about $1 million, he said.

"We decided on VAX-11s because our network information management product is VAX-based, so we get a 26% discount on anything we buy from DEC," Cormier said. The company also wanted a system that could use other manufacturers' equipment, so it could shop around for good prices, he added.

Infinet bought 150 Micro-Term, Inc. Ergo 301 terminals — which are DEC VT100 look-alikes — and 22 M120 printers from Dataproducts Corp., Cormier said. The company was entitled to OEM discounts on the printers because this type of equipment is sold with Infinet's own products, he said.

Company managers then hired an MIS staff and software people, none of whom had any experience on DEC equipment, Cormier said. The company's management decided that known quantities were more important than DEC experience, so everyone that was hired was known by someone in the company, Cormier said. All company employees were trained in computer literacy during 20 hours of courses, and now they are trained as they need it in specific applications, he said.

Infinet's programmer/analysts design, program, test and debug interfaces and modifications to purchased software, and they work directly with users on a day-to-day basis to work out problems, he said.

The company now has fully implemented NCA Corp.'s Maxim MRP system with modules for purchasing and payables, Papantonis said. This system has saved the company $15,000 to $20,000 per month since its installation, he said. Infinet canceled its contract with the service bureau doing MRP for the company and is streamlining the concomitant business systems, he said.

An order management system was converted for use on VAX-11s by Cardinal Data Systems, and Infinet's staff heavily modified the package for their special needs, Cormier said.

A staff programmer wrote a dispatch system that has increased by two to three times the number of calls a dispatcher can handle, Papantonis said, and sometime next year the package will be linked with a logistics program. A Software International Corp. general ledger package and Access Technology, Inc.'s Supercomp spreadsheet are also being used, he said.

Cormier added DEC's ADE and Datatrieve packages for users who want to create and manage their own data and a DECgraph graphics package to use on a recently acquired VT244 graphics terminal and DEC's LA100 graphics printer, he said.

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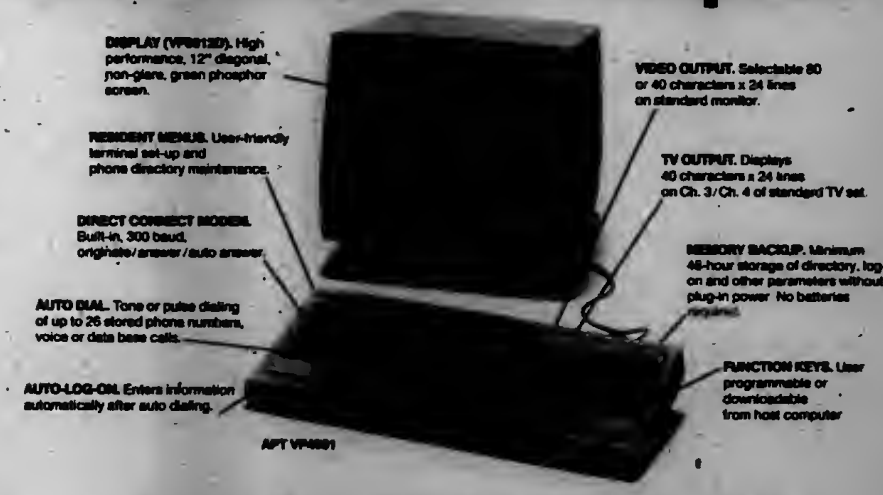

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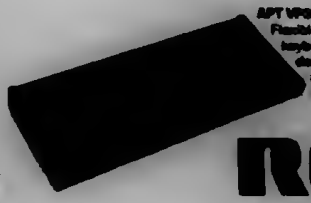

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Surfing scoring system survives waves of adversity

By Jeffry Beeler
CW West Coast Bureau

HUNTINGTON BEACH, Calif. — Unscheduled downtime has become a way of life for George Stokes, designer of a computer-based system for scoring surfing competitions. For more than a year, his travels on the professional surfing tour have taken him and the system, Compusurf, to the corners of the earth — Hawaii, Japan, Australia, South Africa, England and Southern California. Along the way, the system has fallen victim to nearly every environmental trauma known to man and nature. To say the least, the abuse has taken its toll.

"The system is constantly breaking down," Stokes lamented as he surveyed Compusurf's parts lying temporarily idle on his living room floor. Two days earlier, at a formal reception on the eve of one of the pro surfing circuit's biggest competitions, the system had been the victim of a bug. Somehow an errant moth had infiltrated the system's electronic innards and had produced a short circuit when it landed on an electrically conductive surface. The hapless insect died on impact — and so did the system.

If Stokes' creation was a mainframe, life would be cushy — air conditioning, air filtration, first-class accommodations all the way. But Compusurf is no pampered behemoth, just a humble Digital Equipment Corp. PDP-11/23-based system with six hand-held data entry terminals.

Nor does the scoring system enjoy any of the special environmental amenities that are routinely accorded its mainframe cousins. On the contrary, Compusurf necessarily operates outdoors by the seashore and lies fully exposed to the same hostile elements as the judges who use it.

Since it first went into service in June 1983, the system has endured the ravages of withering heat,

A judge using Compusurf.

oppressive humidity, corrosive salt spray and wind-borne sand. Moisture has also proved a continuing bugaboo.

"I remember one competition where a rainstorm broke out, and the canvas cover that was serving as a roof over the judges' stand suddenly collapsed," Stokes said. "A wall of water came pouring down on the CPU, printer and other pieces of equipment."

Mother Nature, however, accounts for only about half the system's trials and tribulations. An equally serious threat to Compusurf's well-being comes from a wide assortment of human handlers.

"Sometimes the judges spill food and soft drinks on the system's [data entry and operator] terminals," according to Alan Wright, Stokes' former technical assistant who recently quit the pro surfing tour to pursue other professional interests.

The system also frequently runs afoul of airport baggage handlers. More times than they care to remember, Wright and Stokes have watched helplessly in horror as surly baggage handlers have vented their frustrations on Compusurf's delicate, carefully crated hardware.

A box containing minicomputer equipment weighs a lot more than it looks. "So when they [the baggage handlers] try to lift our boxes, they're often surprised at how heavy they are, and they get real aggravated," Stokes said.

Wright agrees. "Our equipment gets thrown and bashed around in airports all the time," he said with a pained expression on his face.

However, even the intrusions of wayward insects fail to stagger the equipment for long. Three days after Compusurf's disastrous collision with its kamikaze moth, Stokes had secured the necessary replacement parts and had restored the gear to full operation.

Stokes marvels at the system's toughness and resilience, which he attributes at least in part to its Scientific Microsystems, Inc. packaging. "By all rights, it shouldn't have lasted as long as it has," he said. "It just keeps on trucking."

But even the most durable palooka can absorb only a limited amount of punishment, and Compusurf is no exception. After going for more than a year without preventive maintenance, the system is finally nearing the end of its rope. Corrosion scars its metal skin and deepest recesses like old war wounds. "At this point, it could go out at any moment," Stokes said.

So irreparably weather-beaten, in fact, has the globe-trotting system become that its hardware will soon have to be replaced. So Stokes is working feverishly these days to raise the necessary funds for replacement, estimated at $85,000, including maintenance and transportation costs. Thus far, efforts to woo prospective sponsors have proved fruitless. But the search continues.

In the meantime, Compusurf will keep plugging away. Or so Stokes hopes.

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NEWS

Portable system wipes out surf meet scoring delays

By Jeffry Beeler
CW West Coast Bureau

Ian Cairns no longer travels the professional surfing tour as a competitor. But he still recalls the depressing listlessness of the crowds that watched him cut and maneuver his way to a world surfing championship.

Back then, surfing matches rarely if ever drew much of a visible rise from the people who came to view them. Only in comparatively formal events like tennis or chess did the degree of spectator restraint surpass the emotional reserve of surfing buffs.

No one, however, could justifiably fault the fans for their lack of demonstrable enthusiasm. Nor did the blame lie with the quality of the competition. On the contrary, the problem stemmed from an antiquated scoring system that robbed the sport of much of its immediacy and erected barriers to spectator understanding and participation, Cairns said.

For years, surfing tournaments were scored manually by a six-member panel of judges who rated each competitor's performances on a scale of one to 10 and jotted down their marks on prepared scoring sheets. After each surfer's ride, the judges compared their scores, dropped the highs and lows, averaged the remaining figures and used the resulting total to compute the competitor's relative ranking.

In all, the process of calculating the scores for a single four-man heat frequently took as long as 20 minutes. So much time elapsed between the completion of a particular heat and the announcement of the competitor's final scores that surfing matches were frequently dull and difficult for spectators to follow, Cairns said.

"What the competitions have always been missing in the past is a clear understanding by the spectators of who is winning and losing," he added.

The old method of keeping score manually was also said to be prone to error. Clearly, the situation was in dire need of reform.

The wave of the future

So when Cairns retired from competition and became executive director of the Association of Surfing Professionals (ASP), he vowed to find a remedy. His search for an improved scoring system soon convinced him that high technology was the wave of the ASP's future.

So in June 1983, an improbable marriage of silicon and beach sand took place when the association began using Compusurf, its first computer-based scoring system. Since then, the high-tech wave has taken the ASP on a long, mostly satisfying ride, Cairns said.

Under the Compusurf system, the judges who officiate at ASP-sanctioned events still rely heavily on manual scoring techniques for backup. But the judges also record their scores on Computerwise, Inc. Trans Term-1s, hand-held data entry terminals with touch-sensitive keyboards and liquid crystal displays.

From the six terminals, the raw scores are fed into the system's Digital Equipment Corp. PDP-11/23, which automatically totals the figures, determines each competitor's ranking and displays the results on two DEC VT100-compatible CRT units. Within seconds, the scores and standings are announced to the crowd over a public-address system.

Gone are the lengthy delays between the completion of individual heats and the announcement of scores. The result is a substantial improvement in the ability of surfing spectators to understand and enjoy the sport, Cairns said.

Compusurf's hardware was packaged by Mountain View, Calif.-based Scientific Micro Systems, Inc., but its software owes its existence to George Stokes, head of Innovative Data Processing Co., a Huntington Beach, Calif.-based consulting firm.

Stokes, a former competitive surfer who later went into programming, described members of the pro surfing circuit as his system's biggest fans, and Greg Day wholeheartedly agreed. Day, a four-year veteran of the ASP tour, has a career history reminiscent of Stokes'.

Surf by day, program by night

Until 1980, Day programmed by night and surfed by day in his native Australia. But when he lost interest in programming, he swapped his printed circuit boards for a board of a different sort and devoted himself full time to riding the waves.

For the first two years or so of Day's professional surfing career, the ASP was still relying exclusively on its manual scoring system, which most tour members reportedly disliked. Under the previous method, Day recalled, "the competitors often didn't know where they had scored in relation to the other surfers or whether they needed another wave to move up in the standings." But today, with the adoption of Compusurf, access to scores and competitive rankings have improved.

As for the future, Stokes hopes soon to replace all his system's existing hardware, which is already in an advanced state of disrepair. Thus far, however, the search for a corporate sponsor willing to underwrite the replacement has failed.

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For surf circuit analyst, job hazards ride with the tide

By Jeffry Beeler
CW West Coast Bureau

No one knows better than Alan Wright the physical and mental perils that await a computing professional on the international pro surfing circuit.

Last March, Wright joined the tour as an analyst and maintenance specialist for Compusurf, a computer-based system for scoring surfing competitions.

A few months later, he quit the job to expand his professional horizons. But before doing so, Wright encountered many of the same physical hardships as the system he was charged with tending.

Although he was retained primarily for his prowess as a technician, his duties inevitably included a variety of menial tasks as well. One such chore was the repeated packing and unpacking of Compusurf's heavy hardware.

As a technician, Wright quickly proved his mettle, according to his former boss, George Stokes, an independent consultant who designed all the system's software. But Wright never claimed to be a champion weight lifter.

So before long, the strain of manually lugging Compusurf's parts from one remote corner of the globe to another began to take its toll. Wright suffered a hernia.

Injuries, however, are by no means the only hazard the scoring system's caretakers face during their worldly international travels. Consider the nettlesome matter of customs officials.

What aggravates Stokes most about having to deal with customs agents is their capriciousness and seeming arbitrariness. "You never know what's going to happen when you take a computer system to customs for inspection," he complained.

"Sometimes, they let you through with no problem at all. Other times, you take the same equipment to exactly the same place and they hassle you. It all depends on who happens to be on duty at the time," he said.

To dispel any doubts about their authenticity, Stokes and Wright always pack their equipment with official documents, including customs entry forms and proof-of-purchase papers. In Australia, the pair was forced to post a $1,500 bond before officials would allow Compusurf to enter the country, Stokes said. "They don't care that you've traveled halfway around the world and that you've got to get to a contest on time. They still want you to fill out forms."

By no stretch of the imagination are Stokes' brushes with the nonsurfing world universally distasteful. He encounters unexpected generosity, cooperation and goodwill almost everywhere he goes.

Stokes related a recent incident involving the Computer Co-Op, a Costa Mesa, Calif., hardware repair shop, which offered to service his system for free when it failed during a major Southern California surfing championship.

When a similar problem arose during an earlier competition in South Africa, one of the repair shops there "let us camp out on their property while we waited for our broken equipment to be fixed," Stokes recalled.

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WESTWOOD COMPUTER CORPORATION

Probe the unknown, advises founder of robotics

By Dennis Rahmandi
CW Staff

FORT LAUDERDALE — "There are enormous opportunities for people in the computer industry if they have a positive attitude and don't have to follow the leader all the time," said George Devol, engineering entrepreneur, inventor of the industrial robot and self-made man.

At the age of 72, when most men are retired, Devol is starting a new business to design, build and lease completely computerized manufacturing facilities for large manufacturers.

Projects do not always end up where the inventor wants them to, Devol said. In 1946, Devol applied for patents on a magnetic recording device and the machine tool that controls it, he said. His vision was that the device would be used with computers.

From Remington to robot

Remington Rand Corp., which later bought the Univac Co., bought his patent, but returned it in the late 1950s when Remington Rand decided the device was too slow for their computer. "I looked around and decided to use it for a robot," Devol said.

'I am inquisitive. I read. Look at the big companies — they were all started by people who were inquisitive.'
— George Devol, entrepreneur and inventor

That was the birth of the industrial robot, now used in manufacturing operations around the world, Devol said. The first practical uses of the industrial robot were to operate die-casting machinery and to weld automobile bodies, he added, a practice that is now standard in the auto industry.

"I was the founder of the [robotics] industry," Devol said.

He sold his patents in 1958 to Consolidated Diesel Corp. The company used them in 1962 to start Unimation, Inc. of Danbury, Conn., the first robot company in the world, Devol said.

From patent to printers

Devol also worked with researchers at Remington Rand Research to develop high-speed printers. "We developed a serial printer that could produce 7,000 line/sec of hard copy, but there wasn't a user in the late '50s who could think of a need for such speed," Devol said, so the printer was never produced.

Devol knew at age 18 that the traditional college-to-career-to-retirement path was not for him, he said. Instead of enrolling in MIT in 1932 as his father wanted him to, he started a motion picture sound recording company, United Cinephone Corp. "I had good ideas, but unfortunately [RCA Corp.] had similar ones," he said.

Devol used his knowledge of photoelectric cells, which picked up the sounds on motion picture projectors, to invent industrial electronic registration controls used for printing presses, package machinery, photoelectronic doors and other projects, he said.

Devol

Devol and his co-workers at United Cinephone were pioneers in the use of electronic controls, he said. "No one else was in that business, except for a couple of departments of major companies," he added.

In wartime 1939, research on industrial projects stopped, Devol said. The market for his products dried up, according to Devol, and he went to Sperry Gyroscope Co.'s research lab to work on radar products for the U.S. military.

Devol soon saw a need for radar countermeasures that would interfere with the enemy's equipment, he said. With researchers from MIT and the U.S. Navy, Devol formed General Electronic Industries, which was a major company that lasted until the end of the war, he said.

Going to college would not have helped him, Devol said, because "I always went into areas of industry where nobody else knew anything either. There was nowhere to go to get information, so I generated it."

When asked how he accomplished so much with no college education, Devol explained, "I am inquisitive. I read. Look at the big companies — they were all started by people who were inquisitive."

His advice to would-be inventors is the following: "Learn all you can about general things and, beyond that, try to find something new to get into."

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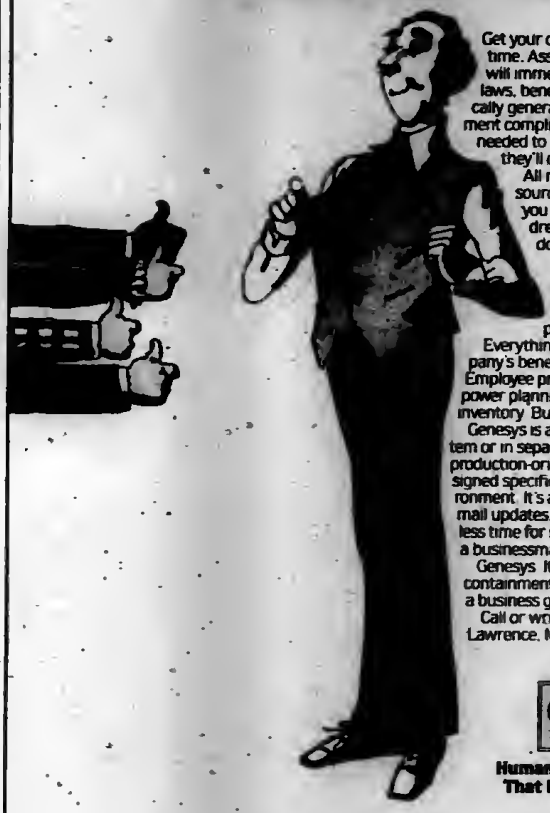

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High-tech tools fuel debate over archaeological dig

Searching for 17th-century artifacts beneath N.Y. construction site

By Maura McEnaney
CW Staff

NEW YORK — At an office building construction site in this city's financial district, computers and other high-tech equipment have played a somewhat controversial role in preserving the past.

When construction plans were announced for the 28-story Broad Financial Center, they raised the concern of the city's Landmarks Preservation Commission, which believed that developer HRO International Ltd. was locating its building on a site important to New York's history. Beneath the site, the Landmarks Preservation Commission suspected, were 17th-century artifacts from the days when the location was part of Manhattan's original shoreline, serving as a trading port for the Dutch West India Co.

Greenhouse Consultants, Inc., a Manhattan-based firm specializing in "rescue archaeology," was hired by HRO last November to coordinate the excavation. As principal investigator of the project, chief archaeologist Joel Grossman was responsible for overseeing excavation, identifying artifacts found and reporting those findings to the commission. Unlike other archaeological digs that can take years to complete, Grossman had just months in the dead of winter to complete his field work in order to clear the way for construction.

To help meet its deadlines, Greenhouse employed various types of technology, including microcomputers for inventory control and artifact analysis, electronic distancing equipment for site identification and a digitizer that produces full, three-dimensional images of broken artifacts.

Grossman reconstructing artifacts

According to Grossman, with the help of the computers all information had been read into the data base within three months, and the project was near completion. The final project report is expected by year's end. Despite Grossman's belief that technology significantly helped the company meet the project completion date, others in the archaeological community have their doubts.

Archaeological controversy

City archaeologist Sherene Baugher of the Landmarks Preservation Commission said the use of computers and other high-tech equipment used in the Manhattan dig has created a controversy within archaeological circles. According to Baugher, the dig was completed no faster than other similar Manhattan projects, some of which reaped many more artifacts.

Grossman contends, however, that without the help of the computers, it could have taken several more months to complete. Baugher maintained that "Other firms in New York City don't use the high-tech stuff, and they are questioning whether they need it." The answer remains to be seen, since the cost of the dig is not known, and the final report has not yet been seen, she said. "We know it didn't save time, but we don't know if it didn't save money. It's sort of like having a new surgical technique that no one has used," Baugher said. Without seeing the results or having anyone else do it, it is hard to make a decision, she said.

Archaeologists have experimented with computers since the mid-1970s, relying on mainframe systems to process the volumes of information that result, Grossman said. However, heavy usage, system crashes, the need for a systems support staff and poor telephone communications have created some problems for scientists, he said.

Faster access

By using micros, scientists can get faster access to the data base, Grossman said. In this instance, however, electrical capacity prevented Greenhouse from installing the computers on the construction site.

An IBM Personal Computer with expanded memory and a 5M-byte hard disk and an Apple Computer, Inc. Apple IIe were used in creating the project's archaeological data base. Entering descriptive information about the type and location of more than 43,000 artifacts found at the site allowed Grossman to create a factual data base that avoided any sort of scientific interpretation.

In addition to the micros, Grossman used Micro Control Systems Inc.'s Perceptor, a three-dimensional digitizer that can draw an artifact composite from a fragment. "I don't have the time to spend two months reconstructing pots," he said. Using the graphics system, the computer can calculate the volume of the pot from a single broken chip, Grossman said.

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

SYDNEY — Information Engineering Pty. Ltd. has released the first is a series of products that will eventually result in an expert system generator for use on the IBM Personal Computer, according to the vendor. The User family of software will reportedly focus on the user's definition of his own data and generate an expert system that matches the user's requirements exactly.

■

CANBERRA — A committee that will examine software protection issues has been formed here by the attorney general's office. Members of the committee include copyright lawyers David Walsh, Jane Levine and Robin Drury; Bob Monic of the Australian Computer Equipment Suppliers Association; and Lindsey Cattermole of Aspect Computing Pty. Ltd.

BRAZIL

BRASILIA — In the wake of the Brazilian Congress's vote into law of a project creating the National Informatics Policy, Brazil's computer market will be formally reserved for Brazilian vendors only for a period of eight years. The Congress also acted to reduce the power of the Special Informatics Agency (SEI) and gave decision-making power to the National Informatics and Automation Council (Conin). Conin will be composed of federal ministers along with industry representatives and will operate under the direction of Brazil's new president, Joao Baptista Figueiredo. In response to this announcement, SEI leaders drafted an emergency informatics plan to take to Congress that will cover one year.

CHINA

BEIJING — The Shenyang Research Institute of Computing Technology has developed a network called Shenet that is based on and is fully compatible with Digital Equipment Corp.'s Decnet. Supported by the RSX-11M/S operating system, it is said to link DEC PDP-11 series computers to form a network with a combined layered/star topology.

■

BEIJING — Optical-fiber cables have been used for computer network transmissions in China for the first time. A data optical-fiber transmission system made by the Telecommunications Equipment Factory has been installed at the Shanghai Research Institute, where it connects the Institute's Wang Laboratories, Inc. VS 100 system to nearby terminals.

FRANCE

PARIS — The French data processing giant, Group Bull, recently signed a letter of agreement with Spain's Department of Electronics and Information Technology, under the Spanish Ministry of Industry and Energy. The two groups will form a Franco-Spanish consortium and will release its production plans in the coming months. The pact calls for the joint development and manufacturing of office automation and communications equipment, sources reported.

■

PARIS. — Compagnie Generale D'Electricite (CGE) has announced its intention to acquire a 19% share of the Dallas-based Communications Corp. of America (CCA) with an option to raise its stake to 40%. If finalized, the deal would give CCA U.S. marketing rights to products from Telic-Alcatel and Thomson-CSF, CGE's two subsidiaries.

INDIA

DELHI — The Parliament of India is expected to announce this week the deregulation of computer imports. Although stiff import duties will continue to be paid to the government, India's Department of Electronics will no longer regulate what kind of computers a company chooses to import. The new licensing policy is intended to grant freedom of decision to companies while maintaining import revenues. The revised duty rate structure is, subsequently, similar to its precedent: Computers valued at up to $17,000 are taxed at 350%, machines costing between $17,000 and $41,500 are taxed at 250%, and computers that cost between $41,500 and $83,000 pay 210% in duties. Computers valued higher than this rate structure still appear to require Ministry approval and are taxed on an individual basis.

JAPAN

TOKYO — In November, it is expected that a new company will be established here to introduce the AT&T Information Systems AIS/Net1000 to the Japanese marketplace. The final start-up of the company, planned by Japan's Network Committee in conjunction with the Industrial Bank of Japan and a consortium of Japanese high-tech companies, has so far been delayed by AT&T. Meanwhile, it is thought that several other Japanese companies are planning to enter the value-added network arena here, including Den Den Kosha.

ENGLAND

LONDON — Four of the UK's largest computer and electronics firms here are currently being investigated by Britain's Department of Trade and Industry (DTI) for alleged breaches in trading regulations. The DTI is scrutinizing the practices of Rank Xerox, Texas Instruments Ltd., General Instruments Microelectronics Pty. Ltd. and a fourth, unnamed company.

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DP center steers production at GM's Mexican arm

Software translates Detroit's designs into localized manufacturing plans

MEXICO CITY — While General Motors Corp. rolls out hundreds of thousands of cars and trucks each year in the U.S., its Mexican subsidiary churns out another 40,000 vehicles annually. To keep the complex and distributed business operations moving along, General Motors de Mexico's (GMM) state-of-the-art data center got a shot in the arm last year.

GMM produces a lineup of Chevrolet-based vehicles at two assembly plants and two engine facilities in Mexico. The company uses an integrated production system for its vehicle manufacturing, which means the design and certain stampings come to Mexico from GM in Detroit, but are locally adapted to the requirements, regulations, vendors and facilities of Mexico.

To handle general business, engineering and design processing, the GMM computer center relies on two IBM 4341 Model 1 systems. One system is dedicated to the production environment, while the second handles development work.

There are roughly 100 terminals scattered between Mexico City and the Mexican cities of Ramos Arizpe and Toluca. In addition, GMM has two other IBM 4341s and one IBM 370/148 system to support manufacturing operations in Ramos Arizpe and one Hewlett-Packard Co. HP 3000 supporting operations in Toluca. For the company's software, GMM turned to Applied Data Research, Inc. (ADR) to meet its wide range of needs.

Guillermo Perez, administrator of information services at GMM's central office here, explained why the company chose ADR when it went shopping for software back in 1983: "With the ADR products, we are developing modules to handle everything from material scheduling and control to production scheduling and control, marketing, credits and collections, vehicle distribution and several other functions."

He said GMM has been able to streamline operations with the installation of ADR/Datacom/DB, ADR/Datadictionary, ADR/Datapquery, ADR/Datareporter, ADR/Vollie, ADR/DL, ADR/Email and ADR/Etc.

Perez said the company sought versatility and performance in its applications software. "GMM is involved in all aspects of automobile manufacture," he said. "We assemble, we manufacture parts, we buy and sell, we import and export, and we use local vendors and parts from [the U.S.]."

He also emphasized the need for products that demonstrated productivity gains, ease-of-use features, an integrated data dictionary, capability for concurrent on-line and batch processing and ease of movement from DOS to MVS operating environments.

The number of tables and fields in place after less than two years is impressive, Perez said. The production data base contains 216 tables with 18 more for test, 100 tables for history and 18 that are still being completed. There are 3,867 fields in the production data base; 1,715 for test and 838 for history.

"We recently selected ADR/Ideal — ADR's fourth-generation application development system — because it seems to be the solution to our backlog problem," he said. "Our work load in development is very heavy and we must get it down as soon as possible."

General Motors de Mexico sought versatility and performance in its applications software because the company is involved in all aspects of automobile manufacture, such as assembly, buying, selling, import and export.

Another ADR product helping GMM is Dataquery. Jaime Mejia, manager for planning in GMM's purchasing department, explained how Dataquery enables him to track parts for the company's 1986 models through a system implemented on Datacom/DB. "The system is in four modules," Mejia said. "One has part information, such as part numbers, description, engineering data and usage. Another contains the information for sample development, including whether or not the part requires engineering approval, how many parts there are, samples for quality control and if the part must undergo design checking."

Mejia said the third module is used to track parts in actual release and by purchase orders; material delivery is handled by the fourth module.

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Firm's computer-based training pays off in fast results

WINNIPEG, Manitoba — The task was a formidable one: Train nearly 200 claims adjusters to use an upgraded computerized claims entry system in one week, without requiring anyone to leave the office. It needed to be done for everyone at once, at minimum expense, and most importantly, with no interruption of service to insurance customers.

The Group Insurance Division of the Great-West Life Assurance Co. here had identified a need to upgrade its dental claims processing system, nicknamed "Ben." Management at the Group Benefits Payment department had targeted improvements in productivity that detailed how the cost of the upgrade could pay for itself within the first year of use.

But the problem of how to train all adjusters in the new system's use without interrupted service to customers nagged Mike Sampson, director of group benefit payments. Because Great-West depends on its computerized entry system to help fulfill its promise to policyholders, claims had to be processed within two weeks.

Sampson sought counsel from Ken Lamoureux, associate manager of technical education, and Garry Slobodian, senior systems training specialist.

"Because of the large number of people to be trained in nine different Canadian offices, and because the training time was severely limited, we began to search for a computer-based training solution," Slobodian said. "It was December 1983 when we started looking. Our absolute deadline for a final solution was April."

Courses anyone could take

Armed with over two years' experience in computer-assisted training, Slobodian looked for an authoring system that would allow Great-West people to create courses that could be taken by anyone on the company's IBM CICS network using existing terminals in branch offices.

"Most of the authoring systems I found were either very comprehensive or very easy to use. I only found one system that provided both flexibility and simple operation — the Phoenix System from Goal Systems [International, Inc.] of Columbus, Ohio," he said.

"We looked at Phoenix in December, attended workshops in applying the system in January, evaluated how it could be adapted to the Ben project and by February had made a commitment to purchase the system. We were impressed that Phoenix would allow us to apply virtually any computer-based training techniques without requiring course developers to be computer programmers.

French version produced

"The system even allowed us to produce a version of the course in French with no appreciable redesign," Slobodian added. He said a French version was needed for personnel who spoke only French.

Subsequently, the course was designed on storyboards to outline what it would teach and the language it would use. The storyboards were turned over to the translation department. Meanwhile, all of the data and screen layouts were entered into the system.

By the time the data was entered, the French language version was ready to be entered into the system. Once work had begun, it took Slobodian and two staff people five weeks to create the course in two languages.

The revised Ben system and the training course were previewed in seminars by branch office supervisors. "We wouldn't normally bother branch supervisors with a simple update in our systems, but this was the first time we had proposed to teach people through computer-based training," Slobodian explained.

At the end of the first week of training, 198 adjusters had spent the required 3½ hours learning the system at their own pace. The course had not tested their proficiency along the way, but the company's training staff in Winnipeg was satisfied that the course had been thoroughly absorbed.

By the end of the first month, the revamped system was operational.

100% productivity claimed

Lamoureux qualified early indicators, but he reported that some people who had never before achieved 100% productivity in their claims entry were at 100% consistently after training. A few people attained 138% of old productivity standards during the first two weeks. The Group Health Benefits area had set itself a goal of 16% productivity improvement, which was revealed in the first three weeks of Ben system operation.

"We have adopted Phoenix as another tool for our information center, which has become quite popular with our end-users," Lamoureux said. "Though we haven't authored any specific courses for the information center, we use Phoenix as a delivery system for packaged courses from other vendors such as Deltak, Inc. and Crwth Computer Courseware, Inc.

"Phoenix is such an easy tool to apply, we may well create courses for our own needs in the information center as specific training areas are identified."

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"One person developed a problem tracking system and had it in operation in less than an hour using Automatic System Facility."

Data Systems Supervisor
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dramatic boost in performance. (Believe it or not, IDMS/R is some 10–20% faster than the previous release of IDMS.) Moreover, IDMS/R has the most sophisticated back-up and recovery capability of any dbms—an absolute must for on-line applications.

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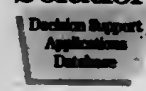

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NEWS

TURNAROUND TIME
Larry Long

Q I am currently seeking a programming job with another company. I have seven years of experience in Cobol programming, but it seems to be on the wrong mainframes. Every company I call would prefer that I had experience on their mainframes. Is there a publication that lists companies and the types of computers they use? Such a publication would make my search for employment easier.

Several marketing services and a number of computer periodicals keep this type of information, but it is old in the form of marketing data and mailing lists. The cost is prohibitive for your purposes.

Just because some potential employers would prefer that you had experience on their hardware does not mean that you are not a candidate. I can understand an employer's reluctance to hire systems programmers who have experience on another vendor's hardware, but Cobol programmers?

Cobol programming skills are very portable. A good Cobol programmer should take no more than a month to learn the idiosyncracies of another vendor's Cobol compiler. An employer who is unwilling to trade a month of reduced productivity for a good Cobol programmer is shortsighted.

Q Three years ago, my boss bought a microcomputer, and it sat idle for six months. I was, and continue to be, the only one interested in using it. During the past 2½ years, I've taken at least one computer science course a semester and have installed several small applications on the micro at work.

In my current position, I spend no more than one day a week with the micro. Another user department and our DP department have both offered me positions that would allow me to work full time on computer-based projects.

The opening in the user department does not involve any development work since all of its applications are supported by DP. They would like someone to do all of their spreadsheet work and generate one-time reports on their microcomputer. Requests involving mainframe systems would continue to be sent to DP. The opening in DP is a Cobol programming position.

I would feel more comfortable in the user department but would prefer the job in DP. Which do you think offers greater opportunities?

Many user-based positions offer technical challenge and career opportunity. The one you described does not. It sounds to me like they want a gopher. Micro applications, especially the interactive spreadsheet packages, are user-friendly and designed for use by the decision maker. Asking an intermediary, like yourself, to obtain information from a spreadsheet is like asking someone to go to lunch for you. It just does not make sense.

If the user position does not offer opportunities to work with DP development and maintenance personnel, take the DP job.

Q Two years ago, I finished the year as one of the leading salesmen in the country for my company's line of office equipment. Our most sophisticated product was a memory typewriter. Seeing that the future was in computers, I took a job with another company selling minicomputers. My 14 months with this company have been a disaster. I feel inadequate trying to sell computers to DP people with 10 to 20 years' experience.

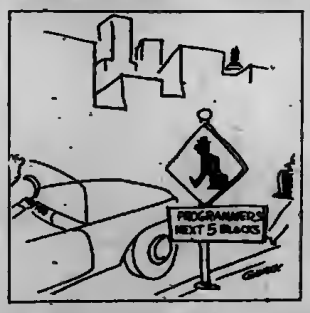
I have not sold one computer and have lost two existing accounts to competitive systems. Is there anything that I can do to turn this situation around?

First, know your product line. Over the years, customers purchasing major computer products have been spoiled by knowledgeable and experienced marketing representatives. Computer types see right through representatives that recite sales handles but cannot respond to the most basic technical questions. If your company does not support a solid educational program, consider night school.

Second, know your client. Learn all you can about the company before you make your first call, then patiently work with it until you understand its current environment and future computing needs. Then you can begin to sell the features of your product. Traditionally, hardware decision makers are not very responsive to high-pressure sales. What worked with office equipment, as you have already found out, does not work with computers. Remember, a company selects both a computer and the support organization.

If you are peddling a second-call product, I would suggest that you seriously consider changing companies. The buyers of mid-size equipment are just too smart now to be sold a bill of goods.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



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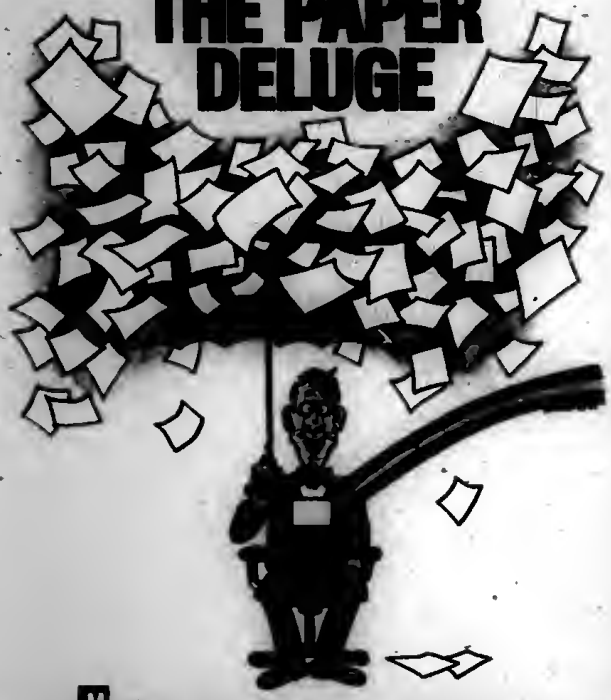

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NEWS

Dairy group milks system for wide array of benefits

SAN ANTONIO — Three years ago, Associated Milk Producers, Inc. (Ampi), a cooperative of more than 31,000 dairy farmers headquartered here, needed an electronic mail system.

Ampi markets milk and processed milk products and has regional headquarters in Arlington, Texas, Schaumburg, Ill. and New Ulm, Minn. In addition, over 40 offices are spread throughout the central United States, each serving the needs of its local members.

As Ampi evaluated the benefits of writing its own package to share information with its members, Hewlett-Packard Co. announced HP Mail, an electronic mail system that ran on HP's 3000 series minicomputers. Rather than start from scratch with its own package, Ampi installed HP Mail, which has subsequently been

Wilson using the HP Deskmanager

enhanced to become HP Deskmanager. "Because our managers frequently have to communicate with managers in other regions, HP Deskmanager was a natural for our needs," said Jim Wilson, Ampi assistant to the controller.

HP Deskmanager integrates electronic mail, filing, word processing and personal calendar functions. Currently, 450 Ampi employees at local offices use HP Deskmanager on terminals that communicate with regional headquarters' HP 3000 minis.

Electronic mail provided a number of functions — from tracking one location's milk processing activities to notification of a dairy bill that has been acted on in Washington, D.C. "Due to the amount of government activity on dairy issues daily, we get information on new rules that must be communicated to our offices," Wilson explained.

In addition to managerial duties, clerical and secretarial tasks are also performed with HP Deskmanager: Accounting clerks make direct entries into the company's general ledger, and secretaries distribute memos directly from their terminals.

Employees use the software's electronic filing cabinet to keep copies of correspondence. In addition to permanent copies within the system, Wilson mentioned that he and others at Ampi create hard copy on their terminals' thermal printers.

Ampi uses another HP Deskmanager subsystem, the pending tray, a tracking feature, to allow the sender to follow up on messages and determine if they have been received and read. Managers ensure that their messages have been read by sending an acknowledgement request.

The time management feature of HP Deskmanager, an automated personal calendar, provides reminders of important activities and notification of meeting conflicts, Wilson said.

"We didn't evaluate our needs in terms of dollars before we chose the system," Harry Pickens, Ampi corporate controller, said. "So we don't have a benchmark to measure against. However, in terms of time saved and office productivity, we feel the system has certainly justified itself."

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Consulting firm molds DBMS to fit project control aim

CAMBRIDGE, Mass. — After a difficult and time-consuming development project, Management Analysis Center (MAC), an international business consulting firm here, brought on-line approximately 100 programs using the data base management system (DBMS) it acquired last year.

MAC employs more than 150 consultants in five domestic and four foreign offices. The consultants have expertise in organizational studies and strategy formulation and implementation.

The company's projects range from one-day speaking engagements to six-month consulting efforts. MAC consultants have conducted zero-based budgeting projects for foreign governments — including Peru and Argentina — upon recommendation from the International Monetary Fund.

With more than 2,000 projects on file, each consultant has billing responsibility for multiple jobs. A complex accounting system was required to support flexible billing instructions established by consultants to determine when time, travel and supply expenses are charged to clients.

MAC's overall goal was to develop a project information library that consultants — through the use of a personal computer — could access and use to design and monitor projects.

Project management system

Using a Digital Equipment Corp. VAX-11/750, MAC developed an interactive project management system.

In branch offices, IBM Personal Computers run emulation programs for the DEC VT100 operating system, communicating via multiplexers and phone lists with the Cambridge headquarters' host computer.

Modifications made to time and expense reports automatically update all other accounting functions — keeping project costs and specifications current.

The latest version of MAC's DBMS, Oracle Version 4 from Oracle Corp., is working fine, said MAC's data processing manager Michael Row, but it arrived six months after it was announced in December 1983, and the previous version, Version 3, he said, had "numerous reliability problems in the data base." MAC had been using Version 3 for applications development since February 1983.

The earlier version of Oracle also had what are called concurrency problems — it locked out other users from a table when that table was in use — and its documentation was "really, really cryptic," Row said. So cryptic, he added, that it become the butt of several office jokes.

Row also cited "performance problems" with Version 3, pointing out that users could establish several blocks or open files on their screens, but could not see the results when they made changes to each block's header field. "What they didn't allow you to do is reflect changes on the screen as you make them," he elaborated.

MAC's DBMS problems were eventually fixed with the arrival of Version 4, now running on MAC's VAX-11/750 minicomputer with between 25 and 30 terminals attached. Row, who spearheaded the development project, said he is "really happy" with Version 4 and, in retrospect, could probably not have avoided the development snags because Oracle "was then the most advanced product on the market."

A month to develop in Cobol

One alternative, he explained, would have been to write the applications all directly in Cobol and, although he did use Cobol for some of them, he said it would have taken a month to develop them all in Cobol and involved "a fortune in programming costs."

The Oracle applications developed by MAC are used for the firm's accounting, billing, project management and other functions. Because it is an integrated package, Row noted, postings to the general ledger automatically are recorded on the project management system as well.

Previously, the company had relied on a nonintegrated system it had brought on-line around 1968, Row said. When the firm found "business had increased dramatically," Row said, it began to look for an integrated DBMS.

At the time, he said, Oracle was largely in use for research applications. MAC, he said, became "one of the first [companies] to use a [DBMS] for any high-volume accounting applications."

As a relational DBMS, Oracle is reportedly based on a series of two-dimensional tables. At MAC, the data base consists of about 100 requirements and is being used to ease data base applications development, to implement internal accounting controls and to evaluate consultant performance.

Eventually, Row observed, an application using Oracle will be developed to allow ad hoc inquiries to the data base by consultants using personal computers at remote locations. An information library of work contact codes, industry codes and client information is now being established, and that data will be meshed with information on consultant skills and project histories.

'Fluid process'

Row singled out Oracle's report writer as a "fluid process for writing reports. By simply changing parameters, we can modify the reports so consultants receive data tailored to their specific projects."

The short-term benefits of Oracle, Row noted, lie in gaining access to timely information and in stringent accounting controls. The long-term benefit, he added, is the access to data for project control and business planning.

"With Oracle, we can know instantly what the project status is and determine cash flow," he added. "We expect our level of business to increase as we use the system to its potential."

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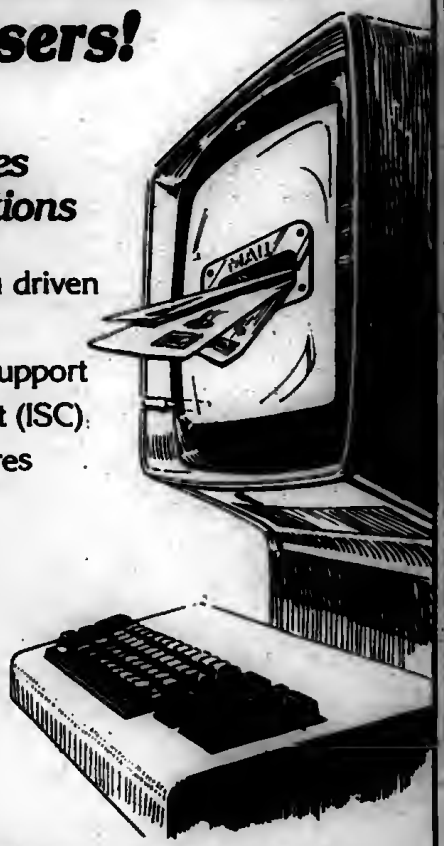

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DBMS serves as main ingredient in restaurant's growth

SEATTLE — Dilettante, Inc., a business owned and operated by the Dana Davenport family here, grew from a family-run restaurant into a nationwide conglomerate.

The company was formed seven years ago when the Davenports opened a restaurant that served candy and pastry based on family recipes. The public's response to the baked goods and chocolate encouraged Davenport to expand and include manufacturing and distribution facilities, three restaurants and retail stores.

At first, the accounting needs of the small business were relatively simple, so all the bookkeeping was done by hand. However, as the company grew from one restaurant to a million-dollar corporation, a computerized system was needed.

"We needed a system that could trace information and integrate inventory, billing, purchasing and accounting software," said Brian Davenport, who is in charge of systems development. "As we examined the market, we realized that we needed a relational data base management system."

Relational system

Davenport looked for a relational data base system that would run on the company's Victor Technologies, Inc. 9000 microcomputer system. He looked at two packages: Ashton-Tate's Dbase II and Microrim, Inc.'s R:Base 4000. R:Base is a microcomputer version of a mainframe data base system called RIM.

Davenport was introduced to RIM while taking a computer course at the University of Washington's graduate school of business.

"Most packages limit you with strictly defined information parameters," he said. "With R:Base, I can tailor specific programs to suit the data processing and analytical needs of our company. I can manipulate and extract data from our product distribution and retail divisions, as well as from cost centers, without re-entering the same facts."

Davenport used R:Base to track information for the marketing department; marketing had inquired about sales of a specific product during a given month. Using R:Base, he was able to compare accounts receivable with the invoice file to see how much of a product had been sold. The marketing department then used the results for supply estimates and sales strategy.

R:Base also helped the company during the Christmas holiday. "The production department needed to know how many gift boxes and baked goods containers to stock in the warehouse in order to supply all the retail locations adequately," Davenport said. "I used R:Base to generate a list of the inventory numbers of gift boxes used during last year's holiday season. From this list, I estimated the most cost-efficient number of boxes to order."

Davenport wrote programs so that R:Base can interface with other productivity software. His company is able to load files created by Micropro International Corp.'s Wordstar and other packages.

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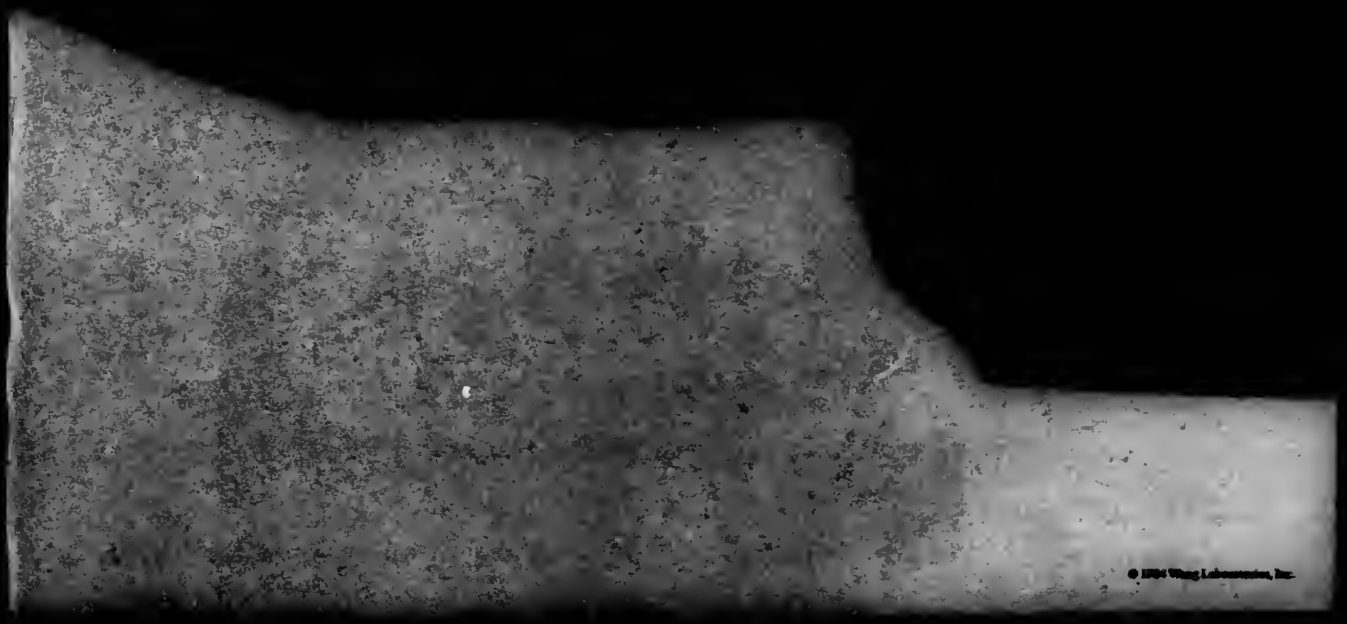

Microfiche device services stock firm's account growth

NEW YORK — Two years after Dean Witter Reynolds, Inc. installed its Active Assetts Account (AAA) financial management package, business had multiplied 14 times to a total of 140,000 accounts that required two sets of daily report updates as well as monthly summaries.

The rapid growth in that heavily used package is among the reasons Dean Witter's DP Communications department needed to augment its two computer-output microfiche (COM) devices with a third. Dean Witter tries to replace as much paperwork as possible with COM, including daily and weekly stock records and the AAA package, according to Vincent T. Healey, manager of DP Micrographics at Dean Witter.

The DP Communications department studied products from four major COM vendors. A unit from Bell & Howell's COM division was chosen, primarily because it had roll film instead of cut film, and the company already had two roll film processing machines, acording to Healey.

The Bell & Howell 6700 COM printer was installed in December 1983.

Four operation centers

Each of four Dean Witter operation centers nationwide supports 5,000 account executives with a battery of stand-alone microfiche reader/printers, used by the executives to research account histories and look up stock reports. The New York center is served by two IBM 3081s and a 3033. Using an on-line COM system, it prints the equivalent of 13,500 to 20,000 paper pages daily on microfiche, Healey said. Nearly every type of information that has to do with Dean Witter's business is printed on the fiche, including ledgers and customer accounts, he said.

Additional volume from batch processing is also printed on the COM printer from a Storage Technology Corp. 2920 tape drive. This off-line system is used for large reports of up to 5,000 fiche, which would tie up the mainframe too long if performed on-line, Healey said.

The company is saving an estimated 200 production hours per year with the Bell & Howell COM system, because a microfilm technical operator can enter a magnetic tape from a Digital Equipment Corp. VT100 terminal while a programmer is working to develop new applications, such as a new type of stock listing. The two operations previously had to be performed one at a time.

The Bell & Howell COM system runs about 20 hours a day, five days a week, to produce in excess of six million frames each month.

Over 30.2 million frames, 120,000 fiche with an average of 250 frames per fiche, were produced on the system the first five months following its installation.

Bell & Howell did burn-in tests with the operating software before the unit was shipped. In Healey's 31 years in micrographics, he said, "It's probably one of the smoothest installations I've been involved with." The initial installation included operator training instruction, software installation and assistance hours.

Dean Witter also elected a biweekly preventive maintenance program with Bell & Howell COM service, according to Healey.

The Bell & Howell COM printer has been down less than .5% of operating time, Healey said. Except for preventive maintenance checks, he said, the system was out of production for only 10 hours during the first 2,200 hours of operation.

Because of the increased demand for new microfiche applications from users throughout the company, Dean Witter determined that all requests for new microfiche applications must be approved on a priority schedule. The company plans to replace sections of paper reports with microfiche and to convert voluminous reports in storage to microfiche, Healey said.

Italo Valentini (left), vice-president of EDP Communications, and Healey, manager of EDP Micrographics at Dean Witter Reynolds.

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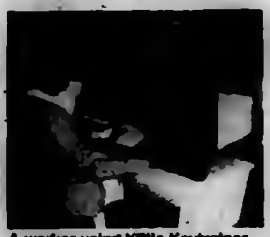
Training program ups productivity as well as work load

LOS ANGELES — In a department with a payroll of a $1.5 million a year, increased productivity can be a money saver in a big way.

A large insurance company here has found a way to budget $400,000 less this year for its data entry department because of that department's hiring changes and the elimination of overtime.

Late last summer, Transamerica Occidental Life Insurance Co. gave its 55-operator data entry department a new responsibility — handling data entry for the company's group insurance line. Picking up these additional tasks increased the department's work load by 20%.

That work load increase implied an immediate staff increase, with attendant costs in both salaries and equipment acquisitions, according to Rich Harry, special projects consultant in data processing corporate systems at Transamerica Occidental. In this case, however, those heavy additional costs were not incurred.


A worker using KPI's Keytrainer.

Transamerica Occidental turned to a training program conducted for the company by Los Angeles-based Keyboard Productivity, Inc. (KPI). The training had been taking place for several months, so the data entry department was ready when its sudden work load increase hit.

The program commenced with a six-month study, training and evaluation period conducted by KPI beginning in February 1982 for the data entry department's night crew, Harry explained. This evaluation provided a baseline measurement, which was compared with test results after the course was completed.

When the post-training results of the first dozen or so trainees were all in, he noted, Transamerica Occidental found that the night crew's productivity, measured by number of keystrokes, had increased by 33%.

A later study to determine how much the increased productivity would decline over time instead showed that the crew's productivity had increased another 34%, Harry said.

Marked improvement in error rate

Perhaps even more important was a marked improvement in error rate, which had dropped to 0.5%. This rate is about a quarter of the national average, according to statistics provided by the Data Entry Management Association, a professional organization for data entry managers, Harry said.

Impressed by the statistics, Transamerica Occidental proceeded to give its entire data entry staff the KPI training course, which consists of 30 hours of instruction in 15 two-hour sessions. The department's productivity is now 40% higher than it was two years ago, Harry noted.

The program itself consists of a series of systematic exercises designed to improve basic keyboarding techniques and eliminate bad habits.

KPI provided audiovisual teaching machines with several tape cartridges containing lessons on subjects such as posture, numerical typing and alphabetic typing. Supervisors learned how to monitor the courses and administer tests and to spot weaknesses in a typist's abilities.

The trainees worked on their own terminals and were connected to Transamerica Occidental's Sperry Corp. 1900/10 minicomputer. That way, test results could be accessed by managers to give them information on each typist's improvement needs.

The KPI program showed Transamerica Occidental the importance of good working conditions to good output by data entry operators. The company brought in chairs for better posture and made some lighting changes. Footrests were installed, and the company replaced all the data entry department's terminal tables.

Enthusiastic acceptance

Employees have enthusiastically accepted the program, noted department manager Amy Kamiyama. She attributed this to a combination of increased job satisfaction and decreased operator fatigue.

Harry said, "Everyone involved has benefited from this program. The cost for the course materials, the training and the complete evaluation of our data entry department by Keyboard Productivity has been returned to us many times."

He noted that his department does not hire new people and often does not replace staffers that leave. The typists that are left have doubled their productivity, he said.

The success of the training program in the data entry department has stirred interest in the insurance company's other departments as well. With the proliferation of video terminals throughout the company, keyboard productivity is not just a data entry issue.

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Cobol compiler helps firm cut costs, enhance services

LAGUNA HILLS, Calif. — A Cobol language compiler for microcomputers has helped a remote computing company here save money and broaden the range of services offered to its customer.

About a year ago, Compudata Business Systems, Inc. decided to switch its on-line services and automobile leasing application software development from a single IBM 370 mainframe to multiple microcomputers. The company markets application software and provides on-line services to about 40 banks for managing their automobile leasing accounts. Compudata was running batch Cobol applications on the IBM system but was looking for ways to improve productivity and profits.

According to Richard Patenaude, general manager of Compudata, the company decided to stay with Cobol even after the switch to micros. "It's a complex language," he said, "but it is still the [language] most widely used by our current and potential customers."

But since running Cobol on a micro is sometimes slow and unwieldy, Compudata knew the choice of a Cobol compiler was vital to the success of the conversion. William Doernbach, data processing manager for Compudata, headed the review of Cobol compilers available to the firm. Doernbach narrowed the choice to Ryan-McFarland Corp.'s RMCobol and the MBP Cobol compiler manufactured by MBP GmbH in Dortmund, West Germany's oldest software house, and marketed in the U.S. by Software and Systems Technology, Inc. of Oakland, Calif.

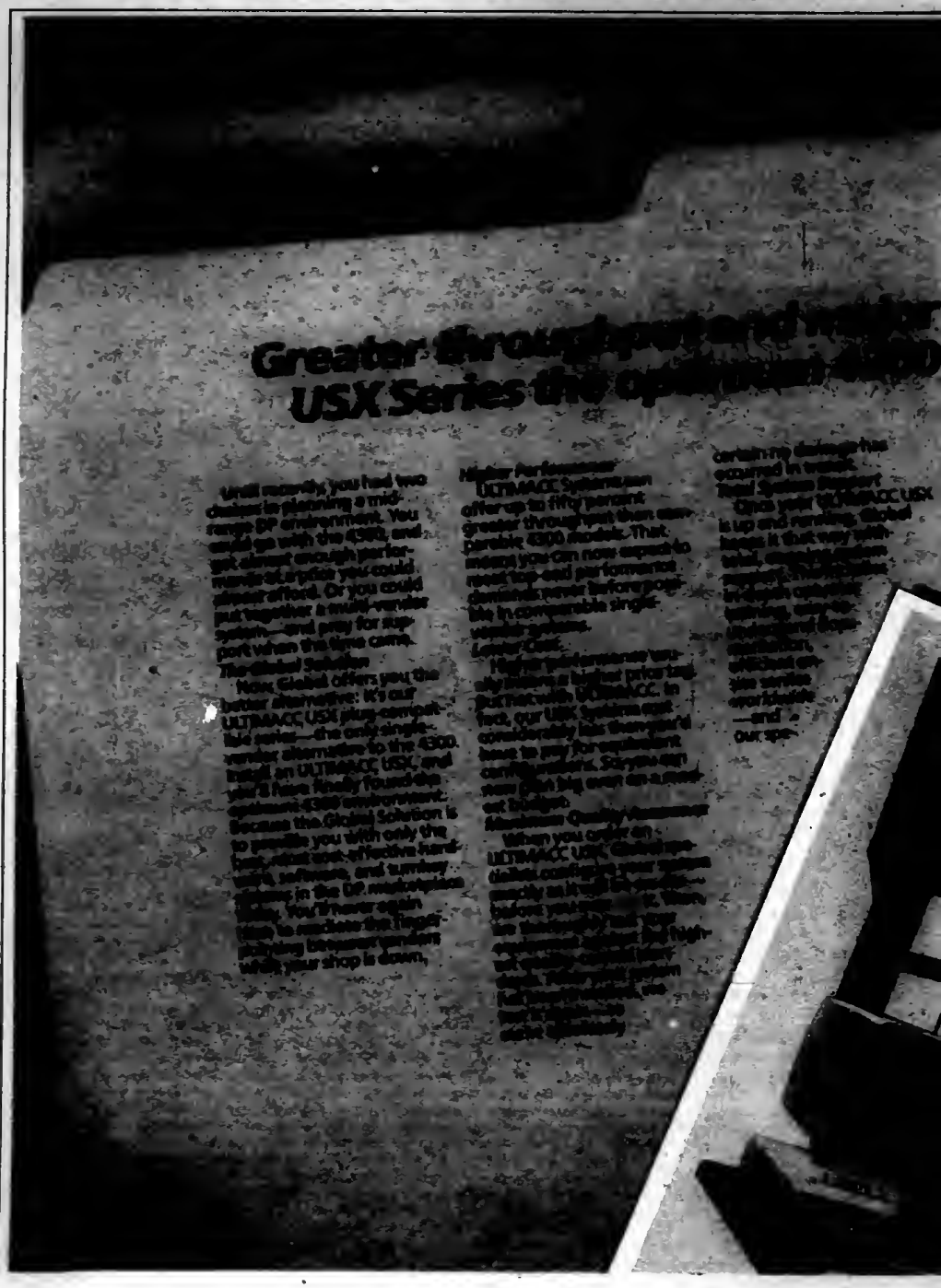
After testing both products, Doernbach selected the MBP Cobol compiler. "We chose it because it allowed us to overcome many of the drawbacks involved in using Cobol on micros," he said. "For example, we found the compiler could execute code four times faster than the other compilers we reviewed. That makes a big difference when you are working with bank leasing programs that contain 20,000 to 30,000 lines of code."

According to Doernbach, the MBP Cobol compiler generated native machine language code instead of the slower psuedocodes produced by traditional interpreter systems. Another advantage, according to Doernbach, was the compiler's portability. "We wanted to be able to use more than one kind of micro," he said. "That was a problem for most of the other compilers we looked at, which were tied to specific machines. The MBP Cobol compiler was compatible with most of the micros we wanted to use. We have already run our Cobol applications on micros from IBM, [Columbia Data Products, Inc.], [Eagle Computer, Inc.] and [Compaq Computer Corp.]"

According to Patenaude, the conversion from the mainframe to the micros went more smoothly than Compudata had expected. "Besides saving money on the mainframe itself," he said, "converting to micros has allowed us to cut down on the use of costly maintenance and operating personnel, saving us more than $50,000 annually." In addition, the conversion has cut Compudata's paperwork by almost 20% and has allowed it to keep its customer accounts more up-to-date.

Patenaude said the changeover has also allowed Compudata to increase its services to include features that are custom-tailored to individual banks' specific needs, something that was not economically feasible on the mainframe system.

The company is also expanding its auto leasing applications for its leading accounts to include investment of tax credit through leasing. "We anticipated that Cobol compiling would be a major operation, tying up a large number of man-hours," Doernbach said. "I never expected it would run so smoothly. Our competitors were surprised as well."



NEWS

Clothier's system tracks styles

April-Marcus, Inc.'s Plexus system

NEW YORK — It is tough for a menswear buyer with over 200 client stores to keep track of menswear sizes, prices, styles, colors and fabrics listed in 50 loose-leaf notebooks, so April-Marcus, Inc. here recently decided to enter the computer age.

April-Marcus is the third largest menswear buyer in the U.S., behind Sears, Roebuck and Co. and J.C. Penney Co. This year, the company, which has 120 employees, will generate an estimated $250 million to $300 million in sales.

"Our business was growing substantially, and we could no longer accommodate clients using a manual system," said Harvey Casher, vice-president of finance for the firm. The manual system was resulting in errors, was slow to process orders and provided little information on what products were selling well in each store.

Wanted: A system to grow

The company wanted a system that could grow for a reasonable price. Because the firm had no data processing department, Decision Systems, Inc. (DSI) of Mahwah, N.J., was hired in mid-1983 to evaluate available systems and make a recommendation.

According to Hirsh Fishman, director of marketing for DSI, systems from IBM, Hewlett-Packard Co. and Plexus Computer, Inc. were considered. For reasons of price and performance, the firm recommended Plexus and a variety of custom software.

April-Marcus' first configuration was a Plexus P/40 16-bit supermicrocomputer running AT&T's Unix with 3M bytes of main memory and two 145M-byte Winchester disk drives. The firm also purchased 36 terminals and a Printronix, Inc. 300 line/min printer.

To automate the merchandising system, the order form was redesigned. Software was customized to print each order form for each vendor with correct sizes and price breaks. Sitting at terminals with their clients, buyers are now able to see how many suits of a certain style and size were ordered, how many were bought and how many are available.

The merchandising department has 60 to 70 programs of it own, addressing such areas as file maintenance, piece goods reservation, an advanced purchasing system, purchase contracts, purchase orders and seasonal reports.

Reports out in 30 minutes

Previously, reports showing whether or not goods are moving took two to three days to perform; they now take 30 minutes, according to Louis Green, vice-president of April-Marcus' merchandising and operations.

The system was first brought up about six months ago. Casher said a relatively smooth transition was made from manual to automated systems. The long-range plan for the firm is to integrate the system with the merchandising operation to monitor vendor performance on deliveries and payments and sales of commodities by store.

"If we're knowledgeable about what we're selling, we can sell more with the same inventory," Casher said.

The ultimate goal, he added, is to have a terminal in every store.

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Oil firm strikes balance to implement data sharing

CALGARY, Alta. — For the technical systems department of a fuel exploration company here, striking a balance between end-user and DP needs during a transition to a data sharing environment proved as complicated a task as striking oil in the field.

"It is too idealistic to expect that all the end users in an organization can readily accept the necessary changes in their approach to the social issues of data sharing, data ownership and privacy," according to Les Brough, manager of technical systems for Home Oil Co., an oil and gas exploration and production company.

To get users to share data, the DP department gave in to some inefficient user requests, knowing it could do away with clutter once users became comfortable with the idea of sharing data, Brough said.

The emphasis during this period was to achieve the corporate data base, but not to jeopardize the success of any of the individual application systems, he said. The data management team was constantly faced with the opposing forces of the corporate goal and the single user.

Shared data base

In one case, Brough said, users refused to identify the same oil wells by the same names. DP nonetheless constructed a shared data base in which users could access information about a particular well, no matter what they chose to call it. The users' names for wells are treated as pseudonyms for the actual well names in the data base.

The overall consideration, Brough said, was to build systems that users would use successfully. He felt that wherever a user refused to accept voluntarily the necessary changes implicit in the shared data concepts being implemented, a controlled compromise — which could later be reversed — would be made in the data base to deliver a successful system.

"We're compromising, but we're not forgetting what we're after," Brough said. "We're controlling the way in which [the compromises] happen so we can back out later."

With this approach, Brough's users became more confident that data processing could support their needs, and users have shared in the benefits of the corporate data base successes.

As a result, Brough said, user attitudes have evolved to the point where even those users who originally refused to adapt later encouraged DP to overcome the shortcomings brought about by the short-term compromises. Those reluctant users, in most cases, have adapted to the new approach, and the short-term compromises have been corrected.

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Conflicting analyses keep Nasa project on course

Software tracking package yields mixed results, flags weak points in system design

GREENBELT, Md. — A software insurance engineer at the National Aeronautics and Space Administration's (Nasa) Goddard Space Flight Center, located here, found that contradictory results often produce worthwhile benefits.

The software engineer and a project manager both worked with one software program that tracks the development of other packages. They used a menu-driven package containing more than 600 questions that tracked all phases of the software development life cycle for a space telescope subsystem project.

The product allowed the engineer and the manager to evaluate the progress of each phase of the project and to perform summary and trend analyses. With the results, each worker produced a composite assessment of the project's health.

'The areas where we disagreed proved most beneficial. The disagreements pointed to numerous aspects of the project that were overlooked. These disagreements produced a better system design.'
— Larry Hyatt, Goddard Space Flight Center

These assessments were then compared. "In many instances, we agreed on our progress, but there were areas where we disagreed," said Larry Hyatt, software insurance engineer at Goddard. "The areas where we disagreed proved most beneficial. The disagreements pointed to numerous aspects of the project that were overlooked and which [might] not have been evident if only one person was evaluating the system. These disagreements produced a better system design."

The software development package was the Project Observation Workbench and Evaluation Recorder (Power) from Expertware, Inc. in Mountain View, Calif. Power runs on an IBM Personal Computer with IBM's PC-DOS operating system. Power presents a series of questions to the user and helps him pinpoint a project's weak or strong points. It can also work as a training aid and automated mentor for novice software managers or as a decision support tool for quality assurance managers, Hyatt said.

Nasa began working with Power in January on a space telescope system project that was completed in March. The results were positive, so Power is now being used in the design of a gamma ray observation product.

Although Hyatt was pleased with Power, he found a few deficiencies with the product. "The software consists of approximately 600 questions," he noted. "Initially, the user may not know what a question refers to. Only after completing a series of questions can one understand what information was desired."

A second, related problem was Power's Help screen and tutorial. "The Help screen and tutorial only tell one how to enter data," Hyatt said. "[They do] not help one discern what information is desired."

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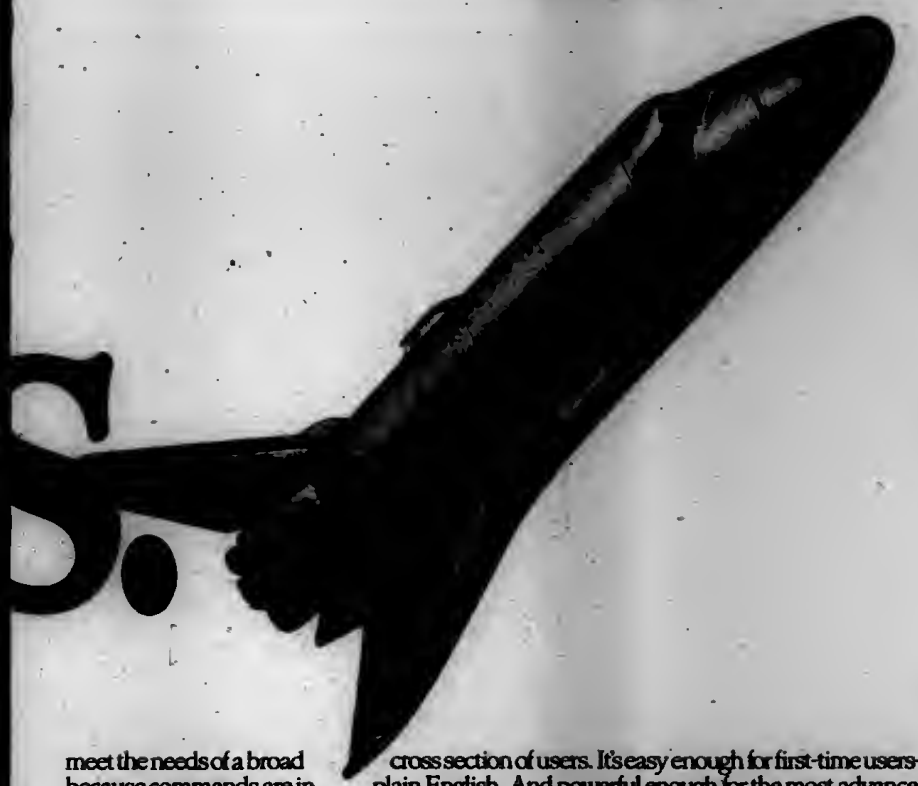

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Electronic system spells success for Cornell publisher

ITHACA, N.Y. — James Mason, assistant director of Cornell University's Media Services, remembers the days when his department stored trays of metal type just in case a printing job had to be run again.

But today, Media Services, one of the largest nonacademic departments here on Cornell's campus, publishes some two million documents a year. It not only stores these printing jobs by bits and bytes, but creates, edits, phototypesets and even distributes many of these publications electronically. The electronic system has substantially reduced the department's cost of producing publications for its clients. It has also improved turnaround time and given the service group the flexibility it needed to enhance document quality.

According to Mason, the department provides all media services for Cornell's College of Agriculture and Life Sciences, the College of Human Ecology and the New York State Cooperative Extension education system. Cooperative Extension, part of the land grant mission of Cornell, has offices in each of New York's 57 counties as well as the five boroughs of New York City. In addition, Media Services accepts assignments from the endowed — or private — division of this Ivy League university and from government agencies as part of the grants and contracts awarded to Cornell.

"We provide the printed materials that support the extension program statewide," Mason said. "Since we publish and distribute nearly two million publications a year through our operation, we are a fairly large publishing group. At any given time, the department has between 65 and 85 publications in the mill, so to speak."

Mason explained the evolution of the department's electronic production system. "We found that more and more of the manuscripts were coming to us from authors, such as faculty members and extension staff, already using a word processing system. Our editors were dealing with manuscripts the old-fashioned way, with pencil and paper, yet the material was stored somewhere electronically. We were getting hard copy, but [a disk was] somewhere out there."

Thus, Mason's department purchased twin Ethernet local communications networks. The networks link five Xerox Corp. 8010 Star information systems, five Xerox 860 information processing systems and two Xerox laser printers. One network is located in the department's printed and visual communications wing, while the other connects devices in another campus building that houses the Media Services' printing shop.

Bypassing keyboard input

According to Mason, the installation of the Star workstations and the Ethernet networks allowed the department to bypass keyboard input of documents in cases where the original manuscripts existed in electronic form. "The first question we ask is 'Is this [document] on a word processor or a computer?' If so, we receive the data over the telephone. We do not have to rekey, so there is less chance for error.

"We can take our clients' word processing input via a modem and run it through the editorial process," he said. "Editing can be done on either the 860 or Star workstations. In addition, the department's design studio has a Star workstation at its disposal so graphics artists can pull a manuscript up on-screen to get a feel for the text and how they want the finished document to look."

One of the advantages of the Ethernet system, Mason said, is that any client with a computer or word processor with communications capabilities can dial into the department's system and dump material directly. Once edited copy is ready for phototypesetting, it is sent via a modem to a phototypesetter across the Cornell campus.

"If we telephone in a manuscript in the morning," Mason said, "we will have galley proofs back in the afternoon. Before the electronic system, we built in a 20-day period to get galley proofs back. Now they are here within one working day."

The Ethernet system allows Mason and his staff of 42 in Printed and Visual Communications to communicate not only with word processors and computers on campus, but also with systems scattered across the country and the world.

"We can format and typeset heads in an italic or boldface font, and the documents look much more professional," Mason said. "This system gives us the flexibility to make a piece much more attractive."

The electronic system has also enabled Media Services to save its clients a good deal of money. "Our word processing costs are $12.50 an hour, but if a client already has committed copy to disk, the costs incurred will only be for Star enhancement. Time on a Star workstation is billed at $14.50 an hour, but if page enhancement takes half an hour, which is about average, the cost to the client is a negligible $7.25."

That savings is also reflected in the cost of the document sold to the public. "All of our publications are priced on a cost formula that includes publishing, printing and distribution," Mason said.

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Design steers Saddledome clear of weather damage

Bhatia in front of Calgary's Olympic stadium

CALGARY, Alberta — The Saddledome, a sports and rodeo stadium which recently opened here, can buck this region's severe weather — despite its unusual, saddle-shaped design — because the stadium's stresses were modeled on a computerized system, according to the building's architects, Jan Bobrowski & Partners, Ltd.

The key to the design analysis system, said Ted Maciag, one of the architectural firm's partners, was its use of GTSTRUDL software from Boeing Computer Services Co. (BCS). The GTSTRUDL software, Maciag said, was used to model the design, analyze the structure and test the movement in a ring beam that ran the circumference of the roof.

The ring beam, made of 16 sections of precast, reinforced concrete, rests on exterior columns, each equipped with multidirectional bearings. The bearings allow the ring beam to adjust in and out horizontally to accommodate changes in Calgary's rigorous weather patterns. Cables are suspended from the ring to create a stress net that holds 391 lightweight concrete panels.

Precise computation of static and dynamic loads is critical when dealing with a large-span suspended roof.

Sudarshan Bhatia, design engineer on the project, explained that the structure's design was analyzed using GTSTRUDL: "The ring beam must continually twist to align itself with the roof. That geometry was very complex. We needed several three-dimensional views from various angles to create visual impact [and] demonstrate to the architect how the structure would look.

"The cable net was very challenging because not many software programs make provisions for cable elements," Bhatia added, noting that Ansys software from Swanson Analysis Systems, Inc. was used for the cable net analysis.

"Ansys has large deflection capabilities, stress stiffening and very good pre- and postprocessing facilities," he explained. "We used this program to calculate various loading conditions."

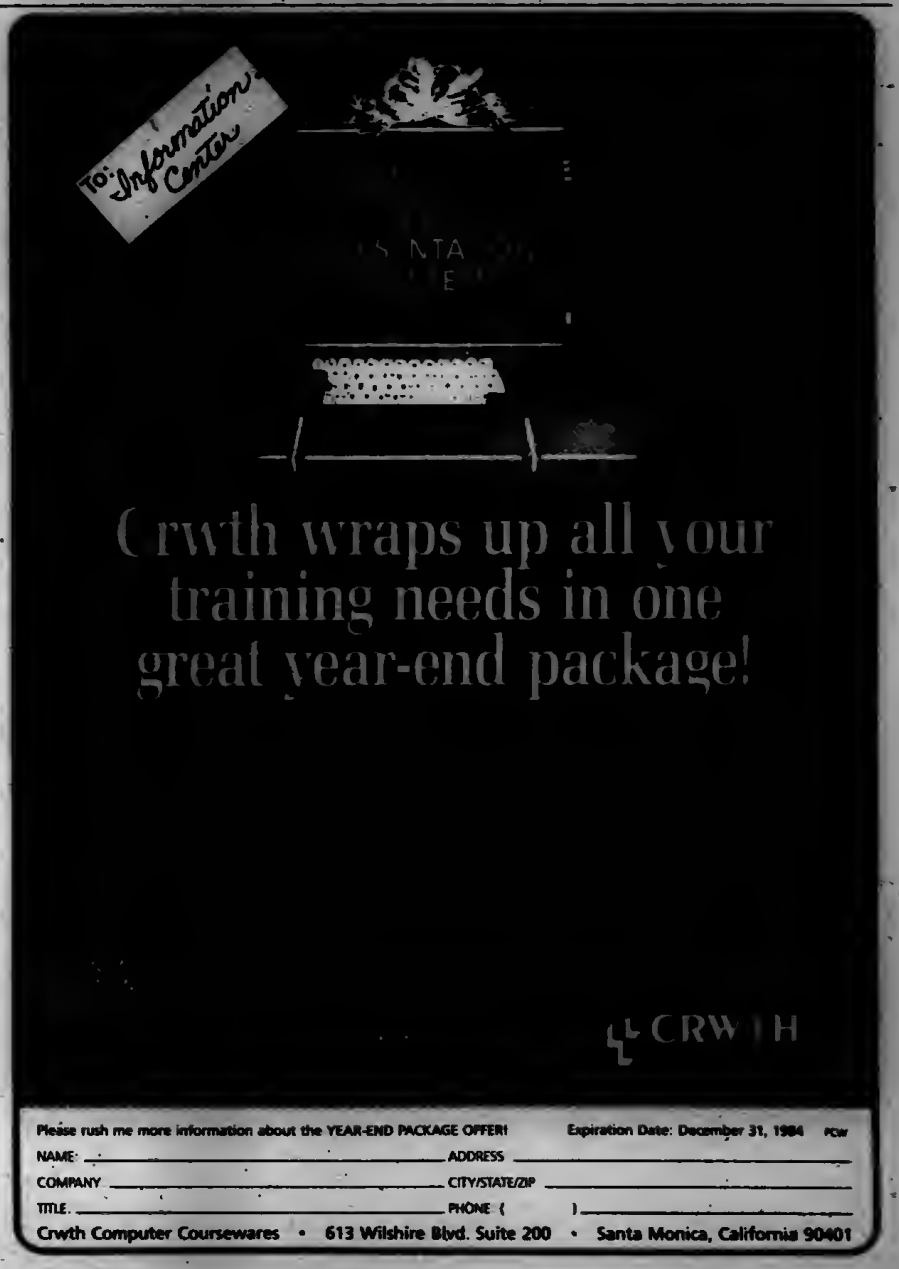
At this point, a second model, implemented with GTSTRUDL, took over and was used to measure all other types of loading, including snow loads, temperature cases and internal suspended loads. Precise computation of static and dynamic loads is critical when dealing with a large-span suspended roof, Bhatia pointed out.

The GTSTRUDL software, Maciag said, ran on a BCS mainframe — a Control Data Corp. Cyber 760 located in Seattle — and was accessed by terminals at the stadium construction site and at the architectural firm's Calgary offices. It took six to 10 months to design the stadium, he said, and about two years to build it.

Throughout the design project, Maciag noted, support from BCS was available "to help us along constantly." Early in the design project, he said, the architects found GTSTRUDL would not permit them to obtain graphic representations of stresses, but, he added, this was later corrected.

The Saddledome's strength — and the architectural firm's design system — were both recently put to the test by a rock music concert at the facility. The event called for an additional 30 tons of equipment to be suspended from the Saddledome ceiling, which already held a 15-ton central scoreboard and a 500-ton catwalk system.

Originally, the designers said no to the idea, but, Bhatia noted, "We reanalyzed the roof for this equipment, checking to see if there would be undue stress concentration anywhere. And we found that there was no distress of any kind."



Sun Pipe tasks flow smoothly with upgraded system

WAYNE, Pa. — When you are responsible for 1,400 miles of pipeline located in some highly populated areas, computer-controlled monitoring becomes a necessity.

That was the thinking behind Sun Pipe Line Co.'s decision to upgrade the system used to monitor conditions in pipeline stretching across five Northeast states.

The subsidiary of Sun Co., which is based here, monitors pipelines that connect oil tanks, pump stations and valve junctions in Michigan, Ohio, New Jersey, New York and Pennsylvania.

From a central control room in the operations department, shifts of two dispatchers are on duty around the clock, 365 days of the year. The dispatchers monitor valve positions and line pressures, along with tank volumes and temperatures for the fuel oils, gasolines and other petroleum-based products that flow through Sun's pipes on some lines at the rate of 6,000 barrels every hour.

The company had been using some kind of electronic monitoring system for years, but several years ago decided to upgrade the equipment.

"What we needed was something that could get out there and back quickly, and a lot of vendors just didn't have it," said Jack Cromwell, supervisor of the computer operations department.

"We have to be very careful," Cromwell said. "The valves and pumping stations are, for the most part, automated and unattended. Some are in relatively high-population areas. A contractor can hit a pipeline and send gasoline spewing out of a pipe at 1,200 pounds of pressure, causing a multitude of problems. So whenever there's a problem anywhere on the pipeline, we have to know about it immediately."

"We rewrote our entire operations-control software, which improved our scan rates tremendously," Cromwell said. "And we shouldn't have to look around seriously for a new configuration for at least another 10 years."

At the heart of Sun's monitoring system are two central processing units, Honeywell, Inc.'s DPS 6/54 small business system and the Level 6 Model 43. The system also includes three Intelligent Systems Corp. color terminals, a Honeywell 80M-byte hard disk drive and software that was developed in-house.

The system is a far cry from Sun's original method for monitoring pipeline conditions. In the late 1950s, Cromwell remembered, "we actually went out to 17 locations and by means of telephone wire, tied them back to the central station, where we had huge control panels with lots of buttons." Unfortunately, he recalled, "operators then had to sit and watch the boards all the time to see what was happening."

Sun purchased its first Honeywell computer in the early 1970s for several reasons. "We needed to expand our system, add more locations and automate more facilities in the field," Cromwell said. "And our business was growing." With a Honeywell H-316, Cromwell's department was able to monitor 28 remote stations, and alarms were set up so that operators did not have to watch their control panels constantly.

With its business growing, Cromwell's operations department in 1976 traded up to the faster and more powerful Honeywell 716. But after several years of designing their own software and even making their own interface boards to tie various machines together, Cromwell and his staff realized that their operations-control system needed a complete overhaul.

With a consultant's help, Cromwell and his staff spent two years examining hardware and software from 17 vendors. Of all his concerns, said Cromwell, the basic one was that Sun's monitoring system included "an awful lot of nonstandard pipeline devices, made specially for us by our engineering department. The hardware and software available from a manufacturer had to be able to talk to all these strange devices. Not many vendors were able to do this.

"The deciding factor in staying with Honeywell," Cromwell said, "was their multiline communications processor. This enabled us not only to talk to our devices in the field, but also to give all messages a common structure which allowed the mainframe to understand them, even though one message might be a tank-level reading and another might be from an analog or digital device."

Another vital part of Sun's decision was moving up to a Honeywell Level 6 Model 43 small computer, which uses a newly rewritten software system for operations control. Almost immediately, Cromwell said, "we transferred this system to a Honeywell DPS 6/54, which is faster than the Level 6. It was a fairly easy conversion because the software for the two machines is compatible."

Today, these two CPUs handle practically every task that Cromwell's staff, and the pipeline itself, can generate. While the DPS 6/54 makes its 30-second scans, receives data and alerts the dispatchers who send out instructions, the Level 6 serves as a completely functional backup system.

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Users gain desktop insight from information center

Insurer saves $250,000 through staff efficiencies, elimination of time-sharing costs

COLUMBUS, Ohio — At the headquarters of Nationwide Mutual Insurance Co. here, marketing executives are charting sales trends, actuaries are studying automobile insurance premium rates and claims representatives are checking the firm's loss frequency — all using programs they developed themselves.

Those employees did not have backgrounds in data processing, noted Virgil L. Pittman Jr., Nationwide's vice-president of systems and data processing. Instead, he explained, the computer users owe much of their expertise to the company's establishment in 1980 of an information center for those needing desktop computing power.

The information center, Pittman said, has since saved Nationwide $250,000 through staff efficiencies and elimination of outside time-sharing costs.

Separate organization

The information center, he explained, is a separate organization within his department that is "dedicated to promoting, directing and coordinating end-user involvement in general data processing." Its existence came about, he noted, from the rise of easy-to-learn programming languages, more accessible data base technology and easy-to-use computers and terminals.

"As time goes on," Pittman observed, "I believe professional and management personnel will increasingly perceive the personal computer as another office tool, such as the telephone, typewriter or calculator. The computer will increasingly make its presence felt in the day-by-day work process of employees at all levels of Nationwide's professional and management staff."

The 1,250 information center users at Nationwide, a $7 billion international firm composed of 60 companies, can use the center's services at the home office, regional offices and client service sites. "In a typical month, about half of all users participate in personal computing," Pittman noted.

Advises users

The center, with a staff-to-user ratio of 1:60, advises users regarding a project's technical feasibility, equipment and costs for time-sharing and staff. The user then makes a choice whether to implement the application.

Among the software in use at the center are several IBM products: VS Basic, a programming language; A Departmental Reporting System (ADRS), a system for processing and outputting data based on specific questions; Executive Presentation System (EPS) for graphics; and Graphics Data Display Manager (GDDM), a utility that permits users to create color business charts.

The information center also uses IBM's VM/CMS in one of its three VM-based 4341 processors. Business graphics and reporting capabilities have since been added to ADRS, Pittman noted.

Personal computing power was initially provided to users via a time-sharing system of IBM 3278 display stations and 3278 printers, while the center itself met the walk-in needs of users with its own seven IBM 3279 color graphics terminals, four IBM 3287 color printers and two IBM Personal Computers.

Nationwide has since also installed 12 Personal Computers — mostly stand-alone micros, but several with mainframe access — and several other microcomputers in areas of the firm with special user needs, he said.

Pittman said the IBM Personal Computers are becoming "a de facto standard at Nationwide" because of their hardware, software and their "potential for serving as intelligent workstations."

Personal computers are being purchased by the center and rented at cost on a monthly basis to users. They are amortized over two years. The rental arrangement "provides clients with an economic incentive to obtain personal computers through the center," he said, while aiding device standardization and avoiding duplication of effort. Quarterly cost justifications are required from users.

The information center, with its staff of eight consultants, supports applications in Nationwide departments ranging from underwriting to claims, finance and marketing. "Each on-line application enables the end user to satisfy needs that could not be met without personal computing capabilities," he said.

In addition, he noted, several applications are being "carried out to satisfy end-user requirements." A regional administration system is used to automate some budgeting and reporting functions, and the marketing department is employing a marketing analysis system to create and analyse information to support rate making. Another system supports accounting functions in Nationwide's Money Market portfolios.

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NEWS

CALL FOR PAPERS

1985 SYMPOSIUM ON SECURITY AND PRIVACY
Oakland, Calif., April 21-24

The meet is being sponsored by the Technical Committee on Security and Privacy and the Institute of Electrical & Electronics Engineers, Inc.

Papers and panel session proposals are being solicited in the following areas: security testing and evaluation; applications security; network security; formal security models; formal verification; authentication; data encryption; data base security; operating system security; privacy issues; and cryptography protocols.

Send three copies of the paper, an extended abstract of 2,000 words or panel proposal by Dec. 14 to: J.K. Millen, Mitre Corp., P.O. Box 208, Bedford, Mass. 01730. Final papers will be due by Feb. 25 in order to be included in the proceedings.

FIRST INTERNATIONAL CONFERENCE ON SUPERCOMPUTING SYSTEMS
Tarpon Springs, Fla., Dec. 16-20, 1985

The conference is being sponsored by the Institute of Electrical & Electronics Engineers, Inc.

Papers on supercomputing systems, software, hardware and applications should be submitted by April 15, 1985 to Prof. S.P. Kartashev, Dynamic Computer Architecture, Inc., Suite No. 6, 933 Oleander Way S., St. Petersburg, Fla. 33707.

Four copies of the paper should be submitted. Length should not exceed 25 double-spaced pages. Authors will be notified of acceptance by June 15, and camera-ready final papers will be due by Aug. 1.

1985 TRENDS AND APPLICATIONS CONFERENCE UTILIZING COMPUTER GRAPHICS
Silver Spring, Md., May 21-22, 1985

The Institute of Electrical & Electronics Engineers, Inc. will sponsor the conference.

Papers are being solicited in applications, hardware advances, robotics, distributed graphics workstations and standards.

Submit three copies of the complete paper or a 500- to 1,000-word abstract by Jan. 15 to: Trends and Applications '85, P.O. Box 639, Silver Spring, Md. 20901.

COMPUTER VISION AND PATTERN RECOGNITION
San Francisco, June 9-13, 1985

The Institute of Electrical & Electronics Engineers, Inc. (IEEE) will sponsor the conference.

Papers are being solicited in the following areas: edges, lines and contours; image representations; texture analysis and reconstruction; segmentation and two-dimensional descriptions; shape and three-dimensional descriptions; motion; stereo; matching; robotic vision; vision for navigation; shape from shading texture; vision hardware; pattern analysis and classification; applications of computer vision; and human perception.

Each paper should have a cover sheet with the title, authors' names, primary address, index terms — including at least one of the above topics — and type of paper (long, short or poster). The body of the paper must contain an abstract of about 250 words. The length of the paper should be appropriate for the final length of the selected type (the number of double-spaced typed pages will be reduced by a factor of about three when typed onto the model paper).

Deadline for papers is Jan. 7. Final papers will be required by IEEE on April 1. Send four copies to: Keith Price, CVPR Program Chair, Electrical Engineering Systems MC-0272, University of Southern California, Los Angeles, Calif. 90089.

DESIGN AUTOMATION CONFERENCE
Las Vegas, June 23-25, 1985

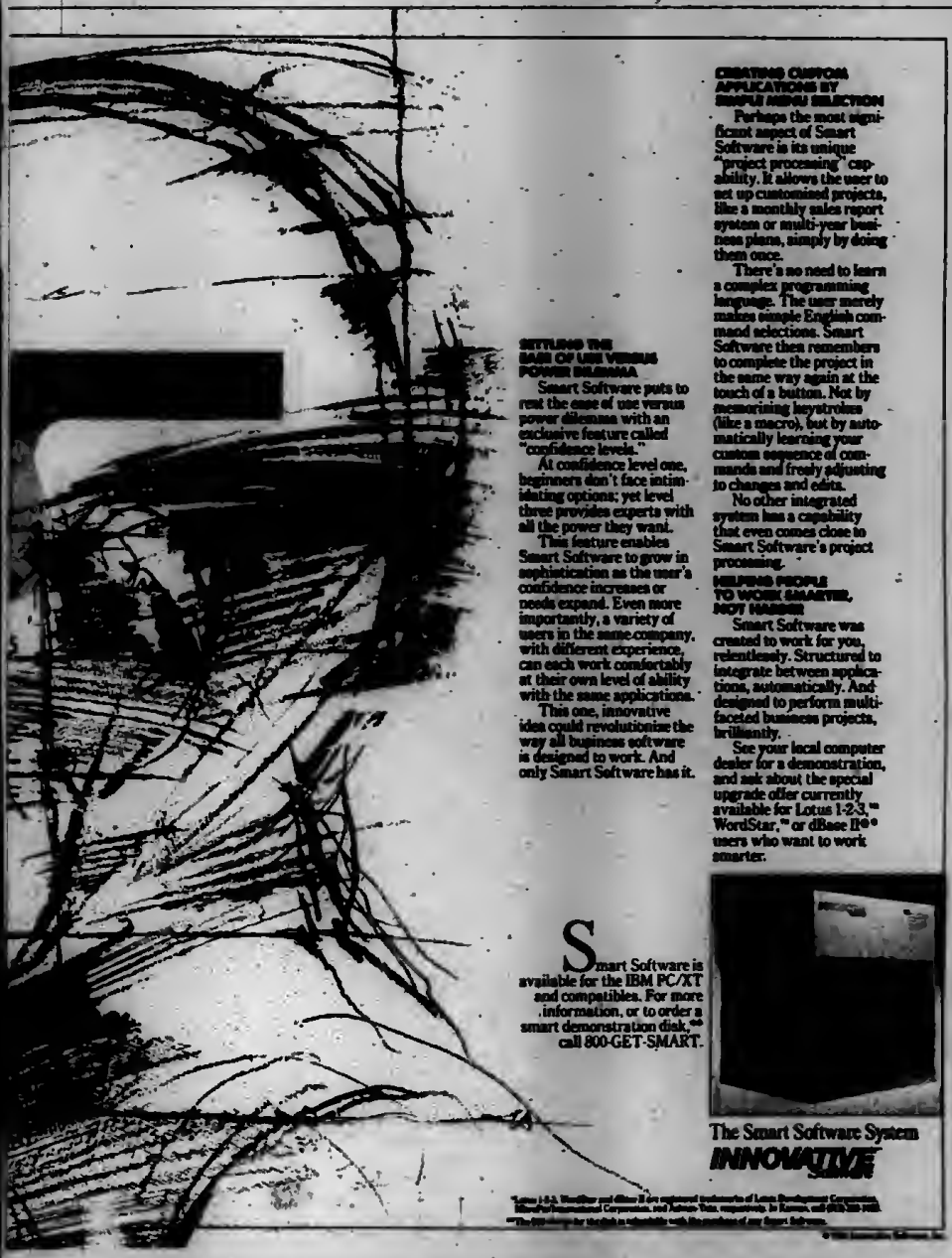
The Institute of Electrical & Electronics Engineers, Inc. (IEEE) is sponsoring this conference.

Authors are invited to submit original papers of recent and novel developments in all areas of design automation. Topics include, but are not limited to: computer-aided engineering, computer-aided design and manufacturing (CAD/CAM); data bases; computer-aided testing, simulation and diagnosis; robotics; integrated circuit layout and silicon compilation; printed-circuit board placement and routing; layout verification and design rule checking; design and synthesis of expert systems; hardware description languages; special purpose hardware for design automation; solids modeling and mechanical CAD; and human factors and software engineering in design automation.

Authors should submit five complete copies of their papers to the program chairman, Lawrence A. O'Neill, Bell Laboratories (2E327), Crawfords Corner Road, Holmdel, N.J. 07733, no later than Nov. 16.

Each copy should include a cover sheet with authors' names, affiliations, complete addresses, identification of principal author and telephone numbers; a title and abstract page with the title of the paper; and a 100-word abstract indicating the significance of the contribution and the numbers of the categories that most closely match the content of the paper. The complete text of the paper in

See PAPER page 60



NEWS

PAPER from page 59

English, including illustrations and references, should not exceed 5,000 words, and the following signed statement should be included: "All appropriate organizational approvals for the publication of this paper have been obtained.

If accepted, the author(s) will prepare the final manuscript in time for inclusion in the conference proceedings and will present the paper at the conference."

THE 12TH INTERNATIONAL SYMPOSIUM ON COMPUTER ARCHITECTURE

Boston, June 17-19, 1985

The conference is being sponsored by the Institute of Electrical & Electronics Engineers, Inc. and the Association for Computing Machinery.

Papers are being solicited on any aspect of computer architecture. Topic areas include, but are not limited to, the following: fifth-generation architectures; knowledge-based systems; artificial intelligence engines; data base machines; support for operating systems and languages; workstation architectures; graphics subsystems; and data- and demand-driven architectures.

Papers will be accepted for evaluation until Nov. 30. Five copies of the manuscript in English, not exceeding 20 double-spaced pages, should be sent to Dr. Tilak Agerwala, IBM Research Division, P.O. Box 218, Yorktown Heights, N.Y. 10598.

CONFERENCE ON SOFTWARE MAINTENANCE — 1985

Washington, D.C., Nov. 11-13, 1985

The conference will be sponsored by the Association for Women in Computing, the Data Processing Management Association, the Institute for Electrical & Electronics Engineers, Inc., the National Bureau of Standards and the Special Interest Group on Software Maintenance in cooperation with the Special Interest Group on Software Engineering.

Papers are being solicited in the following areas: controlling software maintenance; software maintenance careers and education; case studies — successes and failures; configuration management; maintenance of distributed, embedded, hybrid and real-time systems; debugging code; developing maintainable systems; software maintenance documentation and environments; eod-user maintenance; software maintenance error distribution; software evolution; software maintenance metrics; software retirement/conversion; technology transfer; and understandiog the software maintainer.

Submission deadline is Feb. 4, and five double-spaced copies are required. Papers should range from 1,000 to 5,000 words in length.

The first page must include the title and a maximum 250-word abstract; all the authors' names, affiliations, mailing addresses and telephone numbers; and a statement of commitment that one of the anthors will present the paper at the conference if it is accepted.

Submit papers and panel session proposals to: Roger Martin (CSM-85), National Bureau of Standards, Building 225, Room B266, Gaithersburg, Md. 20899.

COMPINT '85

Montreal, Sept. 9-12, 1985

Compint '85 will embrace the theory, design and implementation of computer-aided technologies. Subject areas include robotics; computer-aided design and manufacturing and industrial operations; advanced software for industrial systems; computer-assisted education; computer graphics; computer communications; man-machine interfaces; and computer-aided decision making.

Authors are requested to prepare a long paper of no more than 5,000 words or a short paper of no more than 2,000 words. Long papers will be reviewed on the basis of a complete manuscript. For short papers, a 200- to 500-word summary is required.

Three copies should be submitted, indicating the subject area in which the paper is to be reviewed, by Jan. 15 to: Renato De Mori, Compint '85, P.O. Box 577, Desjardins Postal Station, Montreal, Que. Canada H5B 1B7.

NEWS

MANAGERS ON THE MOVE

KENNETH C. KASER has joined Nationwide Insurance Co. as director of its data center operations in Cincinnati.

Kaser has 28 years of experience in data processing, serving most recently as director of data operations at Bank One in Columbus, Ohio, a subsidiary of Banc One Corp. He previously headed production management for Bancohio Corp. and was regional sales manager for Control Data Corp. He attended Texas Christian University and the University of Hartford.

■

JOHN J. MIKA has been appointed vice-president of information services for Santa Fe International Corp. in Alhambra, Calif. Mika will provide overall direction and management for computing, office automation, communications and information technology.

During his previous 23-year association with Getty Oil Co., Mika held a variety of managerial and administrative positions in operations, engineering, manufacturing and marketing. He is a 1960 graduate of the University of Pennsylvania, where he earned a B.S. in civil engineering.

Santa Fe International engages in oil and gas exploration and production, contract drilling of oil and gas wells and engineering and construction services.

■

The New York Clearing House Association has elected WILLIAM M. WALSH a senior vice-president and director of data processing. Walsh is in charge of the Data Processing Division, which operates the Clearing House Interbank Payments Systems and the New York Automated Clearing House.

He joined the clearing house in 1963 as director of data processing after an extensive career in that field with Burroughs Corp., Booz, Allen & Hamilton, the Federal Reserve Bank in New York, Carteret Savings & Loan Association and the Connecticut National Bank, where he was senior vice-president for data services. He is a graduate in economics from Franklin & Marshall College.

■

Deloitte Haskins & Sells recently announced the appointment of DANIEL L. ROBERTS to executive-in-charge of information systems and management consulting for their Los Angeles office.

Roberts joined the firm with more than 16 years of experience in information management, data processing and management consulting. He was previously affiliated with another Big Eight firm and has served a number of Fortune 500 firms and similarly sized financial institutions.

■

JOHN FINEGAN has been appointed vice-president, finance and administration, at Faraday Electronics, a Palo Alto, Calif. manufacturer of standard-format board-level products.

Previously, Finegan was vice-president of finance at ECS Microsystems in San Jose, Calif., and had held positions at Altex Scientific and Beckman Instruments. He holds degrees from the University of Massachusetts and Tufts University.

■

THOMAS E. MATTAUSCH has been named director for communications programs of GTE's Diversified Products and Services Group. He will be responsible for developing and implementing employee and public affairs programs for the group.

Mattausch has been with GTE for the last two years. Prior to that time, he was communications and community relations manager for IBM's Information Systems Center in Warwick, N.Y. He received degrees from the University of Iowa and Ball State University in Indiana.

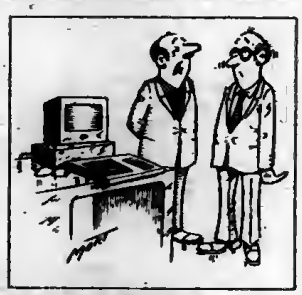
■

Comnet Technology Products has announced the election of three vice-presidents. JAMES A. COLE has been elected vice-president, marketing and development; DR. WILLIAM P. OSBORNE, vice-president, advanced technology; and ALAN KOROBOV, vice-president, finance.

Cole, who will be responsible for the Comnet's marketing and business development, is a founder of Amplica, Inc.

Osborne, who will oversee the development of Comnet product offerings, most recently served as associate professor of electrical engineering at the University of Nebraska. He was vice-president of engineering for Comnet Telesystems from 1980 to 1981 and earlier held positions with Comnet Laboratories. He received a B.S.E.E and M.S.E.E. from the University of Kentucky and a doctorate of science from New Mexico State University.

Korobov most recently served as director of budgets for Comnet. Since 1977, he has held a variety of positions involving the management of the budget functions of Comnet and its subsidiaries. Previous to that time, he had been with TRT Telecommunications. He holds a B.S. in accounting from Benjamin Franklin University.



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CALENDAR

WEEK OF OCT. 28

OCTOBER 31, SANTA CLARA, CALIF. — **Conflict Management: A Workshop for Engineers and Technical Professionals.** Contact: Georgyne Purcell, American Electronics Association, P.O. Box 10045, Palo Alto, Calif. 94303.

OCTOBER 31-NOVEMBER 1, SAN FRANCISCO — **1984 Voice Messaging Tutorials.** Contact: John A. Gutman, Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

OCTOBER 31-NOVEMBER 1, DALLAS — **Advanced Vsam.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

NOVEMBER 1, NEW YORK — **Introduction to Dbase.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 1, WASHINGTON, D.C. — **Assertive Management.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

NOVEMBER 1, NEW YORK — **Dbase Applications Development.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 1, KALAMAZOO, MICH. — **Local-Area Networks.** Contact: Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Nov. 2 in New York.

NOVEMBER 1, CHICAGO — **Executive Strategies for the Information Age.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

NOVEMBER 1, BROOKFIELD, WIS. — **Introduction to Lotus 1-2-3.** Contact: Peat, Marwick, Mitchell & Co., Executive Education Department, Floor 28, 810 Seventh Ave., New York, N.Y. 10019.

NOVEMBER 1-2, SAN FRANCISCO — **IBM vs. AT&T: Round One.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

NOVEMBER 1-2, BOSTON — **Data Base Design.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 01281.

NOVEMBER 1-2, FREDERICK, MD. — **Introduction to Lotus 1-2-3.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

NOVEMBER 1-2, BOSTON — **Managing Time Effectively.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

NOVEMBER 1-2, NEW YORK — **Office Automation Networks.** Contact: Server Technology, Inc., P.O. Box 50340, Palo Alto, Calif. 94303. Also being held Nov. 7-8 in San Francisco and Nov. 12-13 in Los Angeles.

NOVEMBER 1-3, NEW ORLEANS — **Workshop on Languages for Automation.** Contact: Prof. S.K. Chang, Department of Electrical Engineering, Illinois Institute of Technology, Chicago, Ill. 60616.

NOVEMBER 2, NEW YORK — **Introduction to Symphony.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 2, NEW YORK — **Advanced Displaywrite 2.** Contact: Center for Advanced Data Processing, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 2, BROOKFIELD, WIS. — **Advanced Lotus 1-2-3.** Contact: Peat, Marwick, Mitchell & Co., Executive Education Department, Floor 28, 810 Seventh Ave., New York, N.Y. 10019.

WEEK OF NOV. 4

NOVEMBER 4-7, WASHINGTON, D.C. — **Eighth Annual Symposium on Computer Applications in Medical Care.** Contact: Gail E. Mutnik, M.P.A., George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

NOVEMBER 4-7, ORLANDO, FLA. — **Ninth Annual Conference of the Southeastern Telecommunications Association.** Contact: Southeastern Telecommunications Association, P.O. Box 901, Richmond, Va. 23207.

NOVEMBER 5, NEW YORK — **Introduction to the IBM PC.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123

NOVEMBER 5, NEW YORK — **Word Processing with Multimate.** Contact: Center for Advanced Data Processing, Suite 402, 405 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 5-6, WASHINGTON, D.C. — **How to Manage Data Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

NOVEMBER 5-6, NEW YORK — **International Taxation.** Contact: Peat, Marwick, Mitchell & Co., Executive Education Department, Floor 28, 810 Seventh Ave., New York, N.Y. 10019.

NOVEMBER 5-6, SAN FRANCISCO — **Computer Literacy for Managers and Business Professionals.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

NOVEMBER 5-6, DALLAS — **User's Role.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

NOVEMBER 5-6, WASHINGTON, D.C. — **Local-Area Networks.** Con-

See NOV. page 64

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And the moment you finish massaging the data to your liking, our link lets you shoot it back to the mainframe (assuming you have the proper security clearance). You do it yourself on the spot—in real time. Without keyboard operators or programmers. So the entire company has the benefit of the latest information immediately. Not days later.

The M&D PC link is one of several products in our highly acclaimed Millennium family of borderless business software. When you compare the entire Millennium concept to anything else claiming "total integration," you'll see that M&D isn't just out-linking the competition. We're out-thinking them.

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tact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

NOVEMBER 5-7, PHILADELPHIA — **Design of On-Line Systems.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

NOVEMBER 5-7, SAN FRANCISCO — **How to Create and Use a Data Base with Dbase II.** Contact: Institute for Advanced Technolofy, 6003 Executive Blvd. Rockville, Md. 20852

NOVEMBER 5-7, ORLANDO, FLA. — **Balancing Technology and Management.** Contact: Southeastern Telecommunications Association, P.O. Box 901, Richmond, Va. 23207.

NOVEMBER 5-7, CHICAGO — **DL/1 Application Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

NOVEMBER 5-7, NEW YORK — **CICS/VS Application Design.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

NOVEMBER 5-7, BOSTON — **Second Annual Sun Microsystems, Inc. User Group Conference.** Contact: Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043

NOVEMBER 5-8, DALLAS — **National Data Base and Fourth-Generation Language Symposium.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

NOVEMBER 5-8, BOSTON — **Structured Programming.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

NOVEMBER 5-9, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

NOVEMBER 5-9, BOSTON — **Systems Design.** Contact: QED Information Sciences, P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

NOVEMBER 5-13, BEIJING, CHINA — **China Comm '84.** Contact: Clapp & Poliak International, P.O. Box 70007, Washington, D.C. 20088.

NOVEMBER 6-8, WASHINGTON, D.C. — **Federal Office Automation Conference.** Contact: Dallas Kinney, Federal Office Automation Conference, P.O. Box N, Wayland, Mass. 01778.

NOVEMBER 6-8, NEW YORK — **Financial Information Systems.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

NOVEMBER 6-8, SAN FRANCISCO — **Telephone Systems: Their Selection, Operation and Management.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

NOVEMBER 7-8, WASHINGTON, D.C. — **Association for Information and Image Management Manufacturers Meeting.** Contact: Director of Member and Public Relations, Association for Information and Image Management, 1100 Wayne Ave., Silver Spring, Md. 20901.

NOVEMBER 7, NEW YORK — **Advanced 1-2-3 and Graphics.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 7, NEW YORK — **Lotus 1-2-3 Macros.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

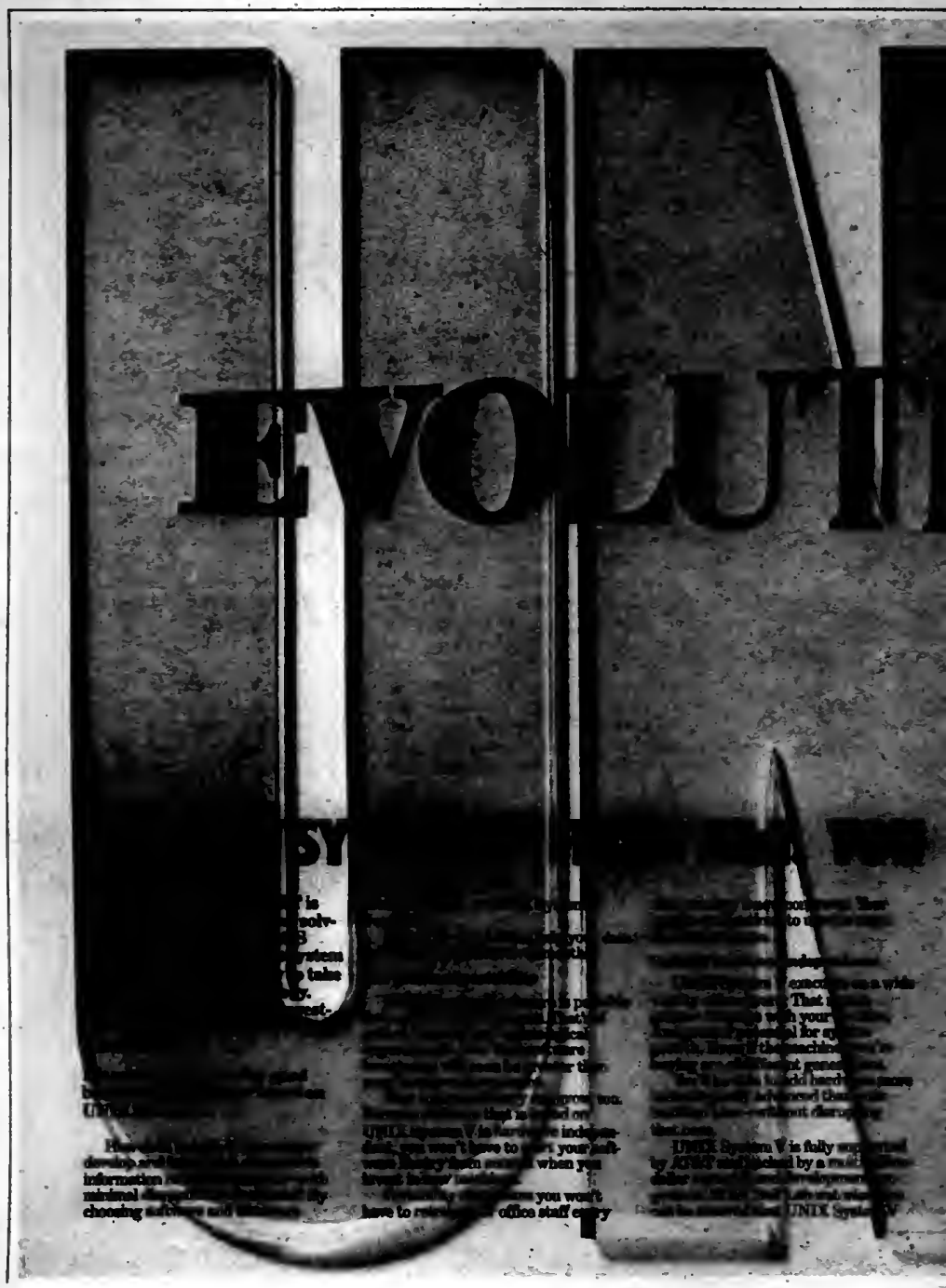
NOVEMBER 7, MIAMI — **Artificial Intelligence — Opportunities and Limitations in the '80s.** Contact: Intelligent Computer Systems Research Institute, University of Miami, P.O. Box 248235, Coral Gables, Fla. 33124.

NOVEMBER 7, NEW YORK — **Displaywrite 2.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 7-8, ST. LOUIS — **Autoweld '84.** Contact: Argenia Ford, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

NOVEMBER 7-8, NEW YORK — **Telecommunications World Update: Innovative Applications and Opportunities.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

NOVEMBER 7-8, CINCINNATI — **Advanced Product Design and Development Techniques.** Contact: Mary Ward, Seminar Activity, General Electric CAE International Inc., 30



NEWS

Technecenter Drive, Milford, Ohio 45150.

NOVEMBER 7-8, HUNT VALLEY, MD. — **Understanding the Income Tax Aspects of Real Estate Transactions: Updated for Proposed & Judicial Administrative & Legislative Laws & Regulations.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

NOVEMBER 7-9, MILWAUKEE — **Systems Project Management.** Contact: Director of Education, Association for Systems Management, 24587 Bagley Rd., Cleveland, Ohio 44138.

NOVEMBER 7-9, CHICAGO — **Eighth International Computer Software & Applications Conference (Compsac '84).** Contact: IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

NOVEMBER 7-9, DEARBORN, MICH. — **Manufacturing & Industrial Engineering with the Personal Computer.** Contact: Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

NOVEMBER 7-9, WASHINGTON, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

NOVEMBER 7-9, PARSIPPANY, N.J. — **MVS Dump Debugging.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

NOVEMBER 7-10, TOKOYO — **Nippon Computer Graphics (Nicograph) '84.** Contact: Nicograph '84 Secretariat, Nikkei-Bekkan 2F 1-2, Uchikanda 2-chome, Chiyoda-ku, Tokyo 101, Japan.

NOVEMBER 8, NEW YORK — **Symphony for 1-2-3 Users.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

NOVEMBER 8, TIMONIUM, MD. — **Management Skills for Women in Business.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

NOVEMBER 8-9, MINNEAPOLIS — **C: Concepts and Status.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

NOVEMBER 8-9, BOSTON — **Structured Testing.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

NOVEMBER 8-9, NEW YORK — **Subchapter C Planning.** Contact: Peat, Marwick, Mitchell & Co., Executive Education Department, Floor 28, 810 Seventh Ave., New York, N.Y. 10019.

NOVEMBER 8-9, NEW ORLEANS — **Premiere System W Users Conference.** Contact: Rachael Gardner, Comshare, Inc., 3001 S. State St., Ann Arbor, Mich. 48106.

NOVEMBER 8-9, ORLANDO, FLA. — **Software Quality Assurance and Verification & Validation.** Contact: Education Foundation of the Data Processing Management Association Seminars, P.O. Box 3608, Department SQA, Torrance, Calif. 90510.

NOVEMBER 8-9, WICHITA, KAN. — **Third Annual Workshop on Computers and the Handicapped.** Contact: Dr. Elmer Hoyer, Box 44, Wichita State University, Wichita, Kan. 67208.

NOVEMBER 8-9, WASHINGTON, D.C. — **Structured Documentation: A Team Approach.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

NOVEMBER 8-10, SAN JOSE, CALIF. — **Edcompcon '84: The Changing Role of Computers in Education.** Contact: Edcompcon '84, P.O. Box 639, Silver Spring, Md. 20901.

WEEK OF NOV. 11

NOVEMBER 11-15, PHILADELPHIA — **Fifth Data Training Conference and Exposition.** Contact: Sandra Mack, Conference Coordinator, Warren/Weingarten, Inc., 38 Chauncy St., Boston, Mass. 02111.

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EDITORIAL

DP crime bill: It's a start

Senate Majority Leader Howard Baker: *Mr. President, a parliamentary inquiry. Has there been a motion to reconsider the vote by which the Senate did not table amendment No. 5727?*

The Presiding Officer: *There has not been a vote to reconsider the motion by which the Senate did not table the appeal with regard to that amendment.*

Mr. Baker: *I thank the Chair for that abundantly lucid explanation of the parliamentary situation.*

— from the Oct. 1 *Congressional Record*

It was not a pretty picture, not a prime example of legislative workmanship by the U.S. Congress. As 535 politicians scurried to go home for heavy-duty election campaigning, there sat computer crime legislation tangled up with aid to Nicaraguan rebels and a "continuing resolution" to keep the federal government operating.

The budget resolution, because it was a must-pass bill, attracted a variety of amendments on such issues as U.S. policy towards Nicaragua, gun control (which prompted the Senate to tie itself in parliamentary knots over amendment No. 5727) and criminal justice.

But at the close of the 98th Congress, the 1,000-page budget resolution — including parts of the computer crime bill, H.R. 5616 — was approved, thanks to some hasty compromises that undoubtedly leave more work to do next year (CW, Oct. 15).

What survived this messy, convoluted process were computer crime provisions that tell hackers and malcontents everywhere they could spend 12 long months in a federal prison for tampering with data in a federal government computer — 10 years if they gain access to classified information. And the legislation makes it a crime to hack into the financial and credit data bases protected by federal privacy statutes.

Along with this good news comes the bad: The House-Senate compromise that produced the legislation also wiped out protection for most private-sector computers, which is a major disappointment for the DP community.

Nevertheless, this legislation is an important first step. In a practical sense, it provides a way to prosecute those who abuse the government's data bases, which are known to be highly vulnerable. In a political sense, the legislation overcomes inertia by putting the word "computer" in the federal criminal statutes for the first time.

Building on this foundation, then, the crucial second step is for the DP community to help Congress develop solid, carefully drafted legislation next year to cover computers used in interstate commerce, as well as data communications. These are areas that clearly warrant federal jurisdiction.

Maybe next year this legislative activity will occur in a calmer, more reasonable climate that befits the drafting of important public policy.

LETTER

Help for VS Fortran users

I have a useful tip for users of VS Fortran in IBM shops. The past compilers utilize an I/O module called Ibcom, for which an ingenious subroutine called Infilq was written to allow in-storage formatting.

The new compiler does not support this because it provides the same ability using new language features. A transparent fix for older programs is simple to implement, however.

Simply provide the link editor with a dummy subroutine with no arguments called Infilq. At runtime, allocate the file(s) using UNIT=VIO in the JCL or Clist. This transfers the in-storage formatting responsibilities to the operating system. Runtime is even improved in my experience and no source code needs to be altered.

This ubiquitous subroutine has caused great concern in the VS Fortran user community. Fortunately, the cure is simple.

Chris Clement
St. Petersburg, Fla.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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VIEWPOINT

Put graphics in the corporate picture

THE DATA CENTER
John P. Murray

Some time ago I published a column here describing my firm's (Rayovac Corp.) fledgling approach to the use of computer graphics and the success we were experiencing with it [CW, March 14, 1983]. During the past year, the use of graphics to provide information in the form of pictures rather than numbers to all levels of the organization, but particularly to the senior management level, has seen dramatic acceptance and growth in our organization. We currently produce in excess of three hundred individual graphs throughout the company each month.

The technology associated with computerized graphs continues to make steady improvement and consequently, the battle to justify the use of graphics becomes easier all the time. Some of these technical advances include:

- A continuing decline in the cost of both graphics hardware and software.
- Significant improvements in the quality of the graphics software. It is now possible — and easy — to produce graphs of very high quality in-house.
- The ability, at least in some of the data base management systems, to tie a graphics capability into the use of the system's fourth-generation programming software language. This offers significant advantages, particularly when the MIS clients can do all the work themselves.

It has been our experience that the acceptance of computerized graphics has been an evolutionary process. We had to do a considerable amount of marketing to senior management to obtain permission to install the required equipment. Once we had the ability to produce graphics via the computer, we had to convince people of the value of using the graphics capabilities.

CW graphic by H. Fling

There are some inherent cultural problems in moving to the use of graphics information. I suspect it has more to do with the general reluctance to change than anything else, but gaining acceptability for the process has taken time. It is interesting that once the use of graphics was accepted in one department, the resistance to its use was much less in other departments. Generally, seeing several side-by-side examples of numbers and graphs, particularly if there is a large volume of detail, is sufficient to sell the idea of the use of graphics. The difficulty comes in getting people to listen to your sales presentation.

Once a department begins to explore the uses of computerized graphics, the areas which can be enhanced through its use tend to expand at a rapid pace. The climate will change from "Why would I want to use graphics?" or "Graphics is too expensive," to one of "I have a number of ideas for new uses of graphics." As has been the case with our information center effort, once the initial skepticism is overcome, the growth of the demand for the process will be rapid.

What areas of an organization find uses for graphics? The short answer is, any area which has a use for numbers will be better served by the use of graphics. The areas within our organization where extensive use is made of graphics include: sales, marketing, finance, manufacturing, accounting, engineering and of course, MIS. In addition, we are producing a growing number of graphs for the members of our executive staff.

As experience with the use of graphics has increased, the complexity of the graphs being produced has also increased. Several separate graphs are now being combined to produce more information on one graph. The graphs themselves are becoming more intricate, and we are beginning to see increased demand for the use of more colors in the graphs and for three-dimensional graphs. As we become more sophisticated in producing these graphs (more detail, more colors, three dimensions), their visual impact becomes more dramatic. Not only do these more sophisticated graphs provide increased information with greater clarity, they also allow those making the presentations to do a more professional job.

There is increasing emphasis on the combining of outside information with the organization's data to produce graphs that provide an increased ability to analyze the business compared with various trends

See GRAPHICS page 68

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Managers: Reclaim system design responsibility

READER'S PLATFORM
William L. Raser

Text books which deal with organizational planning unanimously point out that the data and communications infrastructure is the key element giving form to a business and direction to its development. However, the management system, a major new element in that infrastructure, is being designed by DP personnel rather than management. The future business will, therefore, most likely be the relatively unplanned result of numerous thoughtful decisions by the wrong people. This can change only if the system design process is reconceptualized.

Just as highway engineers are crucial to the successful building of modern interstate highways, computer systems analysts and designers are crucial to the successful building of modern business computer systems. In neither case, however, should these specialized professionals determine system goals, broad concepts of the structure and functioning of the system or the priorities employed for achieving such goals and structures. Those are management decisions.

Initially, the computer was a tool to facilitate transaction processing. Transactions were simply processed more quickly with less people using the computer. DP appropriately performed an essentially technical function. No fundamental changes occurred in the business.

Today, the situation is significantly different. We are in the process of developing management information systems and decision support systems. We are learning that data is a valuable resource and deserves to be managed as such. Information is becoming the stuff of business.

This is roughly what happened with money. Initially, it was simply a tool to facilitate the processing of trade transactions. The real business had to do with the production and distribution of goods. That, obviously, is no longer the case. Money management is no longer a peripheral issue. In fact, our approach to money management has fundamentally reshaped the nature of business organizations.

Those businesses which wish to thrive in the future must recognize that they are in the midst of another fundamental reshaping of the business organization. Such a reshaping must be the focus of management attention. Appropriate organizational structures are not built as the result of the gradual accrual of numerous individual system design decisions. The individual system part makes sense because of its relation to other system parts of a sensible whole. Coherence and subsequent organizational effectiveness begin at the top.

Those businesses which wish to thrive in the future must recognize that they are in the midst of another fundamental reshaping of the business organization.

Top management commitment to such a view will result in the creation of a relatively new executive position, that of the chief information officer or vice-president for information. This position will parallel that of the chief financial officer or vice-president for finance. Under that person, the data base administrator will parallel the controller. Just as the financial officer is charged with responsibility for the monetary resources of the organization, the information officer will be charged with conserving, managing and creatively utilizing the information resources of the organization. Such an organizational change will preceed or produce a fundamental reevaluation and possible restatement of the goals of the organization. Now, however, that reevaluation will occur at the top where it is most appropriate.

The chief information officer will combine strong management skills, in-depth computer information system skills and a broad perspective of the industry. Initially, that person must be extremely creative and must more closely resemble the artist than the logical problem solver.

The primary short-term task of the chief information officer will be twofold. He must define the position of chief financial officer and must gain broad-based organizational recognition and support for that definition. He must also be an integral and highly creative part of the executive team as it undergoes the process of reevaluating the goals and priorities of the organization in this fundamentally different world.

Top management is supposed to have the big picture and long-range strategies for the organization. All too often, however, their time is consumed by much more mundane concerns. The press of such concerns makes it all too easy for management to allow system design specialists in the DP department to proceed piece by haphazard piece to build the future structure of the organization. If the future is to make sense and function effectively, managers must once again manage, and specialists must once again assume their rightful staff, rather than de facto line, position. ‡

Raser is a professor of computer science at Graceland College, Lamoni, Iowa.

VIEWPOINT

Telecommuting: An option for homebound workers

READER'S PLATFORM
Kirby L. Morgan

So you finally talked your boss into letting you work at home using your own home computer.

What happened? Has your productivity fallen off? No, probably not; in fact, you may be able to get a lot more done because you can arrange your work schedule so that there are fewer interruptions.

Are you out of touch with what is going on at the office? Perhaps; especially if you are the only one working at home. But chances are that if your office has a good electronic mail system, you are able to communicate very effectively with your coworkers. Moreover, if your job is in a highly technical field and you have access to a nationwide computer network, you are very likely in touch with more people in your field than you ever could expect to be at any office.

No, despite the worst fears of much of America's corporate management, telecommunicating can work if the conditions are right. Two of the major considerations are the characteristics of the job and the traits of the employee.

The characteristics of the job are generally such that:

- The work requires a minimal amount of equipment, most likely, only a microcomputer (or terminal) and a modem.
- The work is project-oriented and has specific goals and deadlines.
- The work does not require a great deal of immediate communication, but can be handled via electronic mail and an occasional phone call.

The desirable traits of a work-at-home employee include:

- A high degree of motivation and a good deal of self-discipline.
- The possession of specialized technical skills and the ability to communicate ideas effectively through electronic messages.

If you are one of the 50,000 people who telecommutes, this information is probably not new. And if you are one of the 20 million people expected to telecommute by the year 2000, you probably have already thought about the advantages and disadvantages of working at home.

Why do I reiterate all this? Many magazines have had extensive articles on telecommuting. One of the special points made in most of these articles is how beneficial this new working arrangement can be to the homebound handicapped.

By now you may have guessed it. Yes, I am one of those handicapped persons; I am completely bedridden by arthritis. I have no choice but to telecommute — to work at home. I do it — and it works — but believe me, it's not easy. There are still those employers who only see a person's disabilities and not his abilities. Couple that with management's distrust of unsupervised employees and you already have two strikes against you.

What does it matter to you? Well, it may mean a lot to you someday, if you or someone you love becomes handicapped due to an accident or illness. If that happens and you have no other choice but to work at home, will the opportunity be there? You'd better hope so — and you'd better try and do all you can do now to see that your company includes qualified handicapped workers.

Telecommuting isn't for everyone. But if your job and personality meet the criteria listed here, then perhaps someday you will be dialing in, instead of driving to the office. For your sake and the sake of society, make sure that the homebound handicapped have the same chance. ‡

Morgan is a technical consultant and computer programmer based in Charlotte, Mich.

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GRAPHICS from page 67

and situations to support new activities within the organization. As the clients gain experience in these processes the task becomes increasingly easier.

As is the case with most aspects of information processing today, there are many, perhaps too many, options in the field of computer-based graphics. The range of expense associated with the effort can be broad, and there is not necessarily a correlation between cost and quality. While the selection of the products used to produce graphics in your organization should not assume the proportions of a major project, some time and effort should be devoted to this decision. Careful selection of a mix of products can provide a very good graphics environment at a very reasonable cost.

If your information processing department cannot offer graphics capabilities to your information processing clients, you're doing them a disservice. If you have the capability, you should continue to support the effort and be as receptive as is practical to the pressure for growth in this area. The expense associated with the production of computer graphics is small in relation to the beneficial results that can be obtained. Computer graphics is not some type of technical oddity, but a practical, effective business process.

SOFTWARE & SERVICES

DEC introduces manufacturing system for mini

LAS VEGAS — Digital Equipment Corp. has announced the Dectap manufacturing system, intended to run on DEC's Micro/PDP-11 Team Computer and other members of the PDP-11 minicomputer family.

A typical Dectap system consists of a Micro/PDP-11, the Dectap manufacturing operating system, Inventory Management and Order Management software modules, 512K bytes of total memory, two DEC VT220 terminals, a DEC LA 120 printer and two DEC RD52 disk drives, the company said.

The system is said to provide small manufacturers with the ability to evaluate material on-hand, generate competitive quotes and requisitions and plan and release shop orders. Four software modules are available to provide status reports, inventory and production management and quote capability. The modules can be tailored to individual businesses by changing such variables as labor rates or overhead, the company said.

DEC's Dectap manufacturing system

The Inventory Management software provides access to material information needed to fill customer orders and control raw materials. The module also provides stock status reports and supply/demand analysis. With the order management module, manufacturers can manage customer quotes and orders as well as manufacturing orders. The system can also identify possible material shortages, generate purchase recommendations and plan and release shop orders, the company said.

The Product Data Management module

See DEC page 84

Cooperation key to productive audit

SOFTLINE
Les Gilliam

You've no doubt heard it said, "An auditor is someone who comes in after the battle is over and shoots the wounded." Maybe that has been your experience with auditors, but it should not be so. The obstacles that keep the auditing process from providing maximum benefits can, of course, be associated with the intent and qualifications of the auditor. They could also be related to the attitude of the information systems manager and his receptiveness to someone "looking under the rug" of his department.

The pace and pressures to which most information systems managers are subjected these days are often extreme. They rarely have the time to back away from the forest and identify those trees which are very productive — and why — as well as those trees which are not fulfilling their purpose.

An auditor can be very helpful if the right one is used and if the information systems manager cooperates with and

See AUDITOR page 82

Gilliam is a Ponca City, Okla.-based independent consultant with 28 years of data processing experience. He is a regular contributor to Softline.

Job scheduling cuts time 70%, reduces errors

STRATFORD, Conn. — Faced with scheduling problems that were dramatically impeding its data center operations, Avco Corp.'s Lycoming Division here has automated its job scheduling and execution procedures with notable results.

Avco Lycoming is a worldwide manufacturer of gas turbine engines. About two years ago, the company began to modernize its Information Systems and Services Department (ISSD). An IBM 3081 mainframe replaced an IBM 3033, and the terminal network was expanded to more than 600 terminals with remote job entry and batch support for two of its divisions. Work load production of ISSD grew in two years to an average 45,000 jobs a month, including about 7,100 for production and the remainder for tests.

Using two automated software packages from Dallas-based Uccel Corp. (formerly University Computing Co.), Avco Lycoming has decreased production scheduling time by more than 70% and has eliminated many errors that existed under the previous manual system, according to Mario Salvatore, ISSD computer operations manager. The automation was done specifically in scheduling and rerun/restart systems. The packages chosen were UCC-7, an automated production control system, and UCC-11, an automated rerun and job management system.

"Under our old manual system, information was stored on punched cards," Salvatore said. "Each job required a separate card, which meant thousands of decks had to be filed. It was very easy for a deck to be dropped or misfiled. And it didn't allow us to be as productive as we knew we had to be."

Additionally, if a particular job needed an override instruction in the job-control language (JCL), the instruction had to be punched onto cards manually and inserted into the deck. Such a system was labor-intensive, time-consuming and left room for errors, Salvatore said.

Avco Lycoming installed UCC-7 in May

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■ A recent Input, Inc. report sheds some light on IBM's probable software strategy for the rest of the century/71

■ Goal Systems International, Inc. has announced an interactive performance monitor for IBM's VM operating system/72

■ Carleton Corp.'s mainframe data retrieval systems are now offered with a microcomputer link/72

■ Software Express, Inc. has added a package of development tools to its Appgen application generator/72

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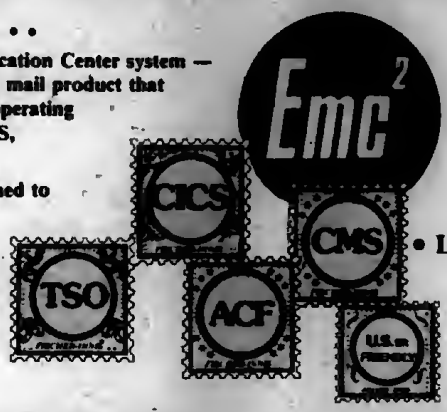

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Boeing products enhance Mainstream service network

Document transfer system and value-added versions of Dissos, Profs released

VIENNA, Va. — Boeing Computer Services Co. has beefed up its office automation offerings with the announcement of a document transfer system and value-added versions of IBM's Distributed Office Support System (Dissos) and Professional Office System (Profs) on its Mainstream remote computer service network. The company also announced a management and consulting service to help organizations plan and build their OA environments.

The Boeing Document Transfer System passes documents among IBM's Displaywriter, Wang Laboratories, Inc.'s VS and OIS and Xerox Corp.'s 860 word processors with no loss of text, the spokesman claimed. Other features include document distribution via electronic mail and mainframe document storage and security. The system can be used on time-sharing for an average cost of $1.50 per page or purchased for an average price of $50,000.

Robert Bianchi, office information services manager at Boeing Computer Services, said the document transfer capability has been tested on more than 120,000 pages of documents with up to 98.5% fidelity. "The only place it loses fidelity is if the destination equipment does not have a feature of the originating equipment," he said. The system transforms data line by line with the objective of retaining the intent of the original operator while translating formats and commands to the language of the destination machine.

The Dissos service is for users of IBM office products, including the 8100 Information System, 5520 Administrative System, Displaywriter and Scanmaster I. Support for IBM Personal Computers and 3270-type terminals will be added, according to the spokesman. Dissos offers electronic filing, search and retrieval, electronic mail, a menu-driven format and system and document security.

An introductory price of $8,000 per month for the first three months increases to $12,000 per month thereafter. There is also a $2,500 one-time setup and training fee.

Profs offers the capability to create, file, print and distribute documents; manage personal schedules and meeting facilities; proofread documents and correct grammatical errors; and search and retrieve filed documents. Profs is available on Mainstream at a cost of $305/mo per user ID, not including IBM's Document Composition Facility. A one-time setup and training fee of $1,900 is required.

Boeing also plans to offer a set of management services for OA users. Boeing office systems personnel are available to prepare corporate and strategic office plans, define requirements, identify alternatives and analyze and design office systems.

Boeing is located at 7980 Gallows Court, Vienna, Va. 22180.

'. . . and the toe of a bear and three floppy disks . . .'

Research firm outlines four-stage IBM software strategy

MOUNTAIN VIEW, Calif. — IBM's software strategy for the next century can be roughly divided into four strategic periods, ranging from current emphasis on the computer giant's Systems Network Architecture (SNA) to an eventual focus on customized expert systems. Over the next 20 years, IBM's software strategies will continue to drive market trends.

Those are among the conclusions of a survey titled "Market Impacts of IBM Software Strategies" that was recently released by Input, Inc., a consulting and market research firm based here. In general, IBM will work to centralize control of information through the rest of this decade and then push broadly into vertical markets, the report concluded.

In the process, IBM's revenue from software and knowledge bases will grow from 7% of total revenues in 1984 to 27% in 2000.

The SNA/Distributed Data Processing (SNA/DDP) period, which will continue through the rest of this decade, will see IBM emphasizing SNA as well as its VM and MVS operating systems and its data base management systems, Input projects. "Large host processors and large central data bases will continue to dominate the software strategy," the report said.

The Electronic Office period will extend from 1990 to 1995 and will emphasize the integration of decision support systems, industry turnkey systems and applications packages with electronic office systems.

This will be followed by the Electronic Office Expert System period, which will extend through the year 2000. It will be characterized by expansion into more vertical markets using the electronic office systems created during the Electronic Office period, Input said.

The fourth major strategic period is the Custom Products period, which will extend indefinitely and will be characterized by automation of information services with the interests of the individual in mind. This will include merging of hardware and software products along with expert systems tailored to the individual.

Several recent IBM moves accentuate the company's interest in centralization, the report stated. These include the integration of various file structures through IBM's DB 2 data base management system (DBMS) and its emphasis on microcomputer-mainframe links, which will make workstations dependent upon mainframe data bases. IBM's agreement with Artificial Intelligence Corp. to market the Intellect query language indicates that IBM wants to integrate higher level languages with its mainframe data bases.

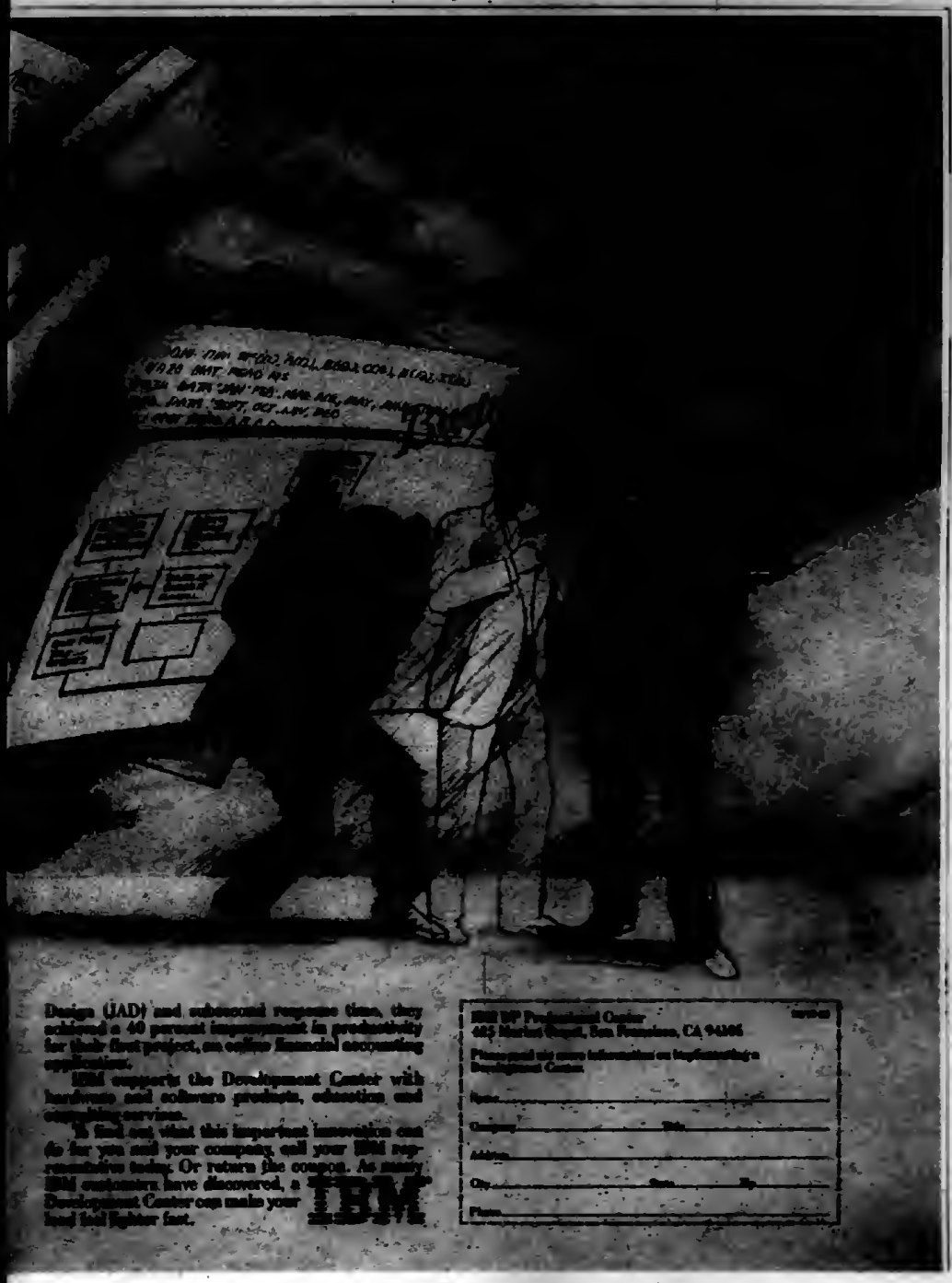
The report said it is difficult to forecast where the computer giant will move in the areas of turnkey systems and applications packages. But it said the potential revenues are too big for IBM to ignore.

But the move to centralize around SNA/DDP presents new problems to IBM, specifically, the question of storage management. "It is Input's conclusion that the demands for the means to manage large data bases may exceed even IBM's hardware/software technology," the report stated.

Consequently, opportunities exist for independent hardware and software vendors in the following areas:

- Products that help to manage and monitor performance better on central hosts. These include storage management systems, performance monitors, distributed applications and security systems.
- DBMS that have new data/information models for the integration of text, data and images and which incorporate optical disks.
- Specialized languages and decision support systems.

The report costs $1,950 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.



Design (JAD) and subsecond response time, they achieved a 40 percent improvement in productivity for their first project, an online financial accounting application.

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Carleton unveils networking products

Offerings link DBMS, formats with personal computer software

CAMBRIDGE, Mass. — Carleton Corp. has announced two products said to link multiple mainframe data base management systems (DBMS) and file formats with personal computer software packages.

CQS-Infolink includes a microcomputer-mainframe link and CQS-Infotec, which is a report writer and information retrieval package. CQS-Auditlink combines link capabilities with CQS-Auditec, a report writer and information retrieval package for data processing auditors. Both products run in IBM's OS and VM environments.

CQS-Infolink and CQS-Auditlink are said to be able to access and report on data from any standard file and many DBMS, including IBM's IMS and DL/1; Software AG of North America, Inc.'s Adabas; Cullinet Software, Inc.'s IDMS; and Cincom Systems, Inc.'s Total. Data is formatted internally for downloading to a variety of micros, Carleton said. Downloads are in Software Arts, Inc.'s Data Interchange Format and Common Separator Values formats.

Networking software in both products is said to control communications and access to extracted files and to insulate the user from the mainframe operating system and data structures. It includes a menu-driven interface, file extract capability, file transformation routines, a mainframe-based file server and micro-based file managers. The products also include CQS-Online, an option that allows users to run interactively under IBM's TSO and CMS.

CQS-Infolink, which includes CQS-Infotec, is priced at $48,000 for VM/CMS and $53,000 for OS. CQS-Auditlink, which includes CQS-Auditec, is priced at $43,500 for OS and $42,500 for VM/CMS. Release is scheduled for the first quarter of 1985.

Carleton is located at 45 First St., Cambridge, Mass. 02142.

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UCCEL has selected Imagine for use with its application software products. Multiplications has offices in the following locations: Cambridge, MA. Atlanta, GA. New York, NY. Oakland, CA. Rochester, NY. Toronto, CN.

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Goal Systems VM monitor released

COLUMBUS, Ohio — Goal Systems International, Inc. has released an interactive performance monitor for IBM's VM operating system.

According to the Goal Systems, Explore/VM can be customized by using IBM's CMS Exec, Exec2 and Rexx languages. Users can add commands, reports and functions and can log additional data.

Explore/VM is said to provide VM performance analysts with both real-time and batch facilities. The real-time facilities are used for monitoring VM's performance on a short-term basis. A series of plotting options are available for comparing data and generating reports immediately. The batch facilities are used for identifying long-term trends.

Historical records of performance data gathered by Explore/VM can be written to tape and/or disk for processing by Explore/VM's reporting facility. Some additional features of Explore/VM are exception reporting, degradation analysis and long-term archiving.

The price of Explore/VM is $5,600 for a permanent license or $140/mo for a three-year renewable license. More information on the system is available from Goal Systems, 5455 N. High St., Columbus, Ohio 43214.

Generator aids offered

HOUSTON — Software Express, Inc. has announced Environment 5, a series of application development tools said to more than double the speed of the company's Appgen application generator. Appgen runs under AT&T's Unix, Microsoft Corp.'s Xenix and Pick & Associates, Inc.'s Pick operating systems.

According to the company, Environment 5 includes a screen painter, which reportedly allows a developer to paint new screens, menus and reports and pass the results to the Appgen Development Environment in real-time. Cost of the function is $1,200 for two to 16 users.

The Automated Quality Assurance (Auto QA) facility is said to provide an automated process for performing quality assurance on Appgen applications. Auto QA does the porting to a developer's machines and demonstrates the finished package. The price is $1,000/machine. Discounts are available for multivendor clients.

The Isis Integration Language uses the Independent Software Interface Standard to integrate Appgen applications with third-party software packages, the company said. The user language reportedly works the same way the query facility sorts and merges data in and out of Appgen applications. Retail price for the Isis Integration Language is $600 for two- to 16-user systems.

Software Express is at 2925 Briarpark Drive, Houston, Texas 77042.

SOFTWARE & SERVICES

SYSTEMS SOFTWARE

DATA 21
CICS.Help

Data 21 has announced CICS.Help, a software package that facilitates the creation, maintenance and attachment of on-line Help screens and windows for IBM CICS applications.

According to the vendor, CICS.Help creates windows and screens on-line, and no reprogramming or recompiling of user or systems programs is required for the addition of CICS.Help to any CICS psuedoconversational application. CICS.Help windows are displayed based on cursor location, ensuring specific help each time the CICS.Help key is pressed.

CICS.Help saves the applications screen at help request time prior to displaying a CICS.Help screen or window. It restores the applications screen, with all data entered prior to and during the display of CICS.Help, before returning control to the user application program. The one-time license fee for CICS.Help is $1,950.

Data 21, Suite 300-5, 3868 Carson, Torrance, Calif. 90503.

C.J. SOFTWARE
Showdata

C.J. Software has announced a batch utility for reviewing program test results that prints files and databases according to the Cobol copy member that describes the file or segment. Showdata runs under the IBM MVS operating system and requires 256K bytes of memory.

Showdata prints formatted reports where data fields are printed separately preceded by their Cobol names. Binary and packed fields are automatically converted to decimal before being printed. Fields that do not contain valid data are printed in vertical hexadecimal.

The package can print any physical sequential, Isam or Vsam file. Up to 15 Cobol copy members or 01 level record descriptions can be used to describe different record layouts.

The price of Showdata is $4,500 for a perpetual license or $1,500 for a six-month lease.

C. J. Software, Suite 904, 3308 Midway Drive, San Diego, Calif. 92110.

SIMPLAN SYSTEMS, INC.
Data Transfer

Simplan Systems, Inc. has released its Data Transfer package, which provides a two-way interface between three-dimensional Simplan data bases and two-dimensional matrices or spreadsheets. The package operates on IBM and plug-compatible mainframes running under IBM's OS and VM/CMS operating systems.

Most file transfer software can be used to transport the matrices between the host and microcomputer environments, the vendor said.

The matrices may be stored in any of three formats: a standard print file, a print file that accommodates file import numbers in Lotus Development Corp.'s 1-2-3 and Software Arts, Inc.'s Data Interchange Format.

Data Transfer can be purchased as an option to both permanent and annual Simplan license holders at a price of $5,000 and $750, respectively.

Simplan Systems, 300 Eastowne Drive, Chapel Hill, N.C. 27514.

COMPUTING CAPABILITIES CORP.
Maestro

Computing Capabilities Corp. has released a batch job control system for Hewlett-Packard Co.'s HP 3000 computers. Maestro allows the user to specify timing, sequencing and dependencies for schedules and jobs on one or more HP 3000s.

A master console program is provided so the operator can see the production of any linked HP 3000 at any time from any linked HP 3000. The production schedule for several computers may be kept on a single machine.

The base price of Maestro is $9,000.

Computing Capabilities, Suite 122, 465A Fairchild Drive, Mountain View, Calif. 94043.

HORIZON DATA SYSTEMS CO.
Back/Rest Version 2

Horizon Data Systems Co. has announced Version 2 of Back/Rest, a file-oriented backup and restore utility for Digital Equipment Corp. computers running DEC's RT-11 or TSX-Plus operating systems.

Back/Rest works with individual files so that unused disk space is not copied and noncritical data-like swap files can be omitted. Routine functions can be predefined and executed as a command file. File selection criteria, including full wild card support and creation date checks, can be used to include or exclude files.

The price of Back/Rest is $595 for a single CPU.

Horizon Data Systems, 1901 Wildflower Terrace, Richmond, Va. 23233.

MICHAELS, ROSS & COLE LTD.
Free Formatter Release 6.0

Michaels, Ross & Cole Ltd. has announced Release 6.0 of the Free Formatter option for its MRC-Reporter, a report writing module, for the IBM System/38.

The Free Formatter option is said to provide users with report format control without the need to learn programming languages. The latest option includes built-in sum and average functions available for any field at any control break level, the vendor said. It also enables users to define new calculated fields based on the results of sums and averages.

Features of MRC-Reporter Free Formatter are said to include Help key documentation, multilevel security, multifile reports, relational file

Continued on page 74

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SOFTWARE & SERVICES

Continued from page 73

joining, single- or multimember file capability, "flat file" look, unlimited sequencing and total levels, Boolean selection criteria, summing and averaging at total levels, pagination, summary-detail report option, output device control and report modification.

A license for the Free Formatter option is available to current MRC-Reporter users for $800.

Michaels, Ross & Cole, P.O. Box 4533, Oak Brook, Ill. 60521.

ALTERTEXT, INC.
System II media conversion kit enhancements

Altertext, Inc. has introduced enhancements for its System II media conversion kit said to feature such improvements as advanced communications capabilities, built-in bisynchronous communications and four additional ports.

Other enhancements are said to include four disk drives in one cabinet, a newly designed keyboard and terminal and a library of more than 2,000 source-target combinations.

The vendor's computer disk conversion systems transfer documents from one incompatible system or disk to another while maintaining format integrity.

The enhanced communications capabilities are said to enable users to form their own network orchestrating protocol and format conversion as well as disk reading and writing. With the additional four ports, information can be sent asynchronously from a source system to the Altertext and then back out to a target system bisynchronously, the vendor said.

The System II includes a VDT, keyboard, cabinet with power supplies, circuit boards and disk drives. It carries a base price of $15,000.

Altertext, 210 Lincoln St., Boston, Mass. 02111.

CANDLE CORP.
Omegamon/CICS, RTA/CICS enhancements

Candle Corp. has announced enhancements to its Omegamon/CICS and Real-Time Analysis/CICS (RTA/CICS) software monitoring products for IBM mainframes.

According to a spokeswoman, the enhancements include color graphics displays, umbrella transaction support and IBM IMS 1.3 support. Color graphics support includes bar graphs for a number of commands and enhanced color usage for other displays.

Omegamon/CICS for IBM's MVS now supports CICS' use of IMS 1.3 and earlier versions. Omegamon/CICS for IBM's DOS now provides paging information, both under IBM's VM and native DOS/VSE. Both releases provide umbrella transaction support, providing the means to display information about subfunctions within other vendor products as well as in-house developed umbrella transactions.

Omegamon/CICS monitors the performance of CICS and displays the results in real time on an IBM 3270-type terminal. RTA/CICS monitors response time and transaction counts and displays the results in real time. For the first CPU, Omegamon/CICS is priced at $23,500 and RTA/CICS at $9,500.

Candle, Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

EXECUCOM SYSTEMS CORP.
IFPS/Stat Interface

Execucom Systems Corp. has announced a software interface that links the company's IFPS decision support system to SAS Institute, Inc.'s SAS statistical software.

According to a spokesman, the IFPS/Stat Interface allows users to share data between IFPS and SAS and eliminates the manual reentry of data from one system to the other. Using the nonprocedural modeling language of IFPS, the interface accesses SAS to transfer data in both directions between IFPS models and data files and SAS data sets.

In addition, IFPS model and data file solutions can be transferred into SAS data sets. SAS data can also be transferred into IFPS data files, the vendor said. One feature of the interface reportedly passes execution control to an interactive SAS session directly from IFPS and automatically returns control to IFPS after the SAS session is ended.

The interface can also pass commands directly to SAS and simultaneously maintain an active IFPS session. The IFPS/Stat Interface is compatible with IFPS Release 9.0 and 10.0 and SAS Version 82.4 in the IBM CMS and TSO mainframe environments. It is priced at $6,500.

Execucom Systems, 3410 Far West Blvd., Austin, Texas 78731.

INTRAK, INC.
Topics 5.1

Enhancements said to reduce job entry time have been included in the latest release of Intrak, Inc.'s on-line programming interactive control system for NCR Corp. V8500 and V8600 series mainframes.

According to the vendor, Topics 5.1 incorporates the alternate input function used in NCR's VRX 9.3 operating system, which reportedly reduces job entry time by two-thirds, as compared with the previous Topics version.

An execute job command allows the user to execute the existing image of the work file and continue editing, or the user may execute and keep, save or forget the work file, the company said.

Topics 5.1 will support terminals running on NCR 721 communications multiplexers.

The base price of the software is $3,000 per terminal, according to the vendor.

Intrak, 9999 Business Park Ave., San Diego, Calif. 92131.

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SOFTWARE & SERVICES

GEMINI MANAGEMENT SYSTEMS
Infopak

Gemini Management Systems has announced a data compression package for IBM's IMS/DL/1 data base management systems running on IBM's OS and DOS operating systems, respectively.

Infopak compaction is performed using scanning instructions, and fields of the same type are grouped for global packing and unpacking. Working directly with information in the DL/1 control block, the same compaction algorithm is applied to all segments.

The introductory price of Infopak is $8,000 for OS/IMS and $6,400 for DOS/DL/1.

Gemini Management Systems, 42 E. Rahn Road, Dayton, Ohio 45429.

RABBIT SOFTWARE CORP.
Rabbit 3270 Plus

Rabbit Software Corp. has expanded its series of IBM 3270 terminal emulators to allow workstation users to store, review and use host computer data without modifying the host environment or disrupting the 3270 emulation session to run local applications programs, the company said.

The Rabbit 3270 Plus is based on IBM's Systems Network Architecture/Sychronous Data Link Control (SNA/SDLC) protocol. The Ctos/SNA is reportedly compatible with all 16- and 32-bit microcomputers running Convergent Technologies, Inc.. Ctos or compatible operating systems.

Cost of the software is $1,250 for one to four users and $1,500 for up to eight users.

Rabbit Software, Great Valley Corporate Center, One Great Valley Pkwy. E., Malvern, Pa. 19355.

DPI MARKETING, INC.
Vtoc/MGR; Help/MGR; Report/MGR

DPI Marketing, Inc., has announced three utility software packages for the IBM System/34 and System/36 computers.

The Vtoc/MGR is said to analyze the volume table of contents and to indicate the files that are near capacity or underutilized. According to the vendor, the operator can interact directly with the on-line Vtoc to select files and libraries that need to be deleted, reorganized, renamed or resized. Vtoc/MGR calculates the number of diskettes required to back up a file or library.

Help/MGR reportedly allows the DP staff to create and maintain its own help file. Help/MGR enables the user to create a prompt screen for a procedure, the company said.

Report/MGR reportedly provides a technique for the control and distribution of reports produced by the computer. According to the company, Report/MGR allows the user to modify the report distribution, the number of copy procedures and the printer spacing without the use of the DP staff.

It is also said to provide the ability to analyze print output by user and type of report. Report/MGR is said to allow up to 10 different variations of a report to be stored.

All three modules are available for $495; individual programs are available for $225, according to the vendor.

DPI Marketing, Suite 1A, 777 S. Central Expwy., Richardson, Texas. 75080.

AMPACK BUSINESS SYSTEMS, INC.
PC-Mini

Ampack Business Systems, Inc., has announced a combination hardware and software package that emulates IBM's 5251 Model 11 terminal.

Designed for the IBM Personal Computer, the PC-Mini allows the micro to emulate IBM's 5251-11, 5291 or 5292 terminals, the company said. A "hot key" function allows the operator to switch from the Personal Computer mode to the 5251 mode. One mode is suspended while the other is processed.

According to the company, the PC-Mini card is compatible with IBM's emulation card and supports all IBM's file transfer software. The product is said to allow access to the device address and line termination switches, without removing the computer cover. The package includes a card, emulation software, diskette, manual and adapter cable. The PC-Mini costs $775.

Ampak Business Systems, 2640 Walnut Ave., Tustin, Calif. 92680.

PRODUCTIVITY AIDS

ADVANCED SYSTEMS CONCEPTS, INC.
Productivity Plus

Advanced Systems Concepts, Inc. has introduced a series of productivity aids said to be compatible with and include some of the features of the CPF 6.0 release of the operating system for the IBM System/38.

Productivity Plus is said to provide easier programming, analysis, debugging and cleanup. A program

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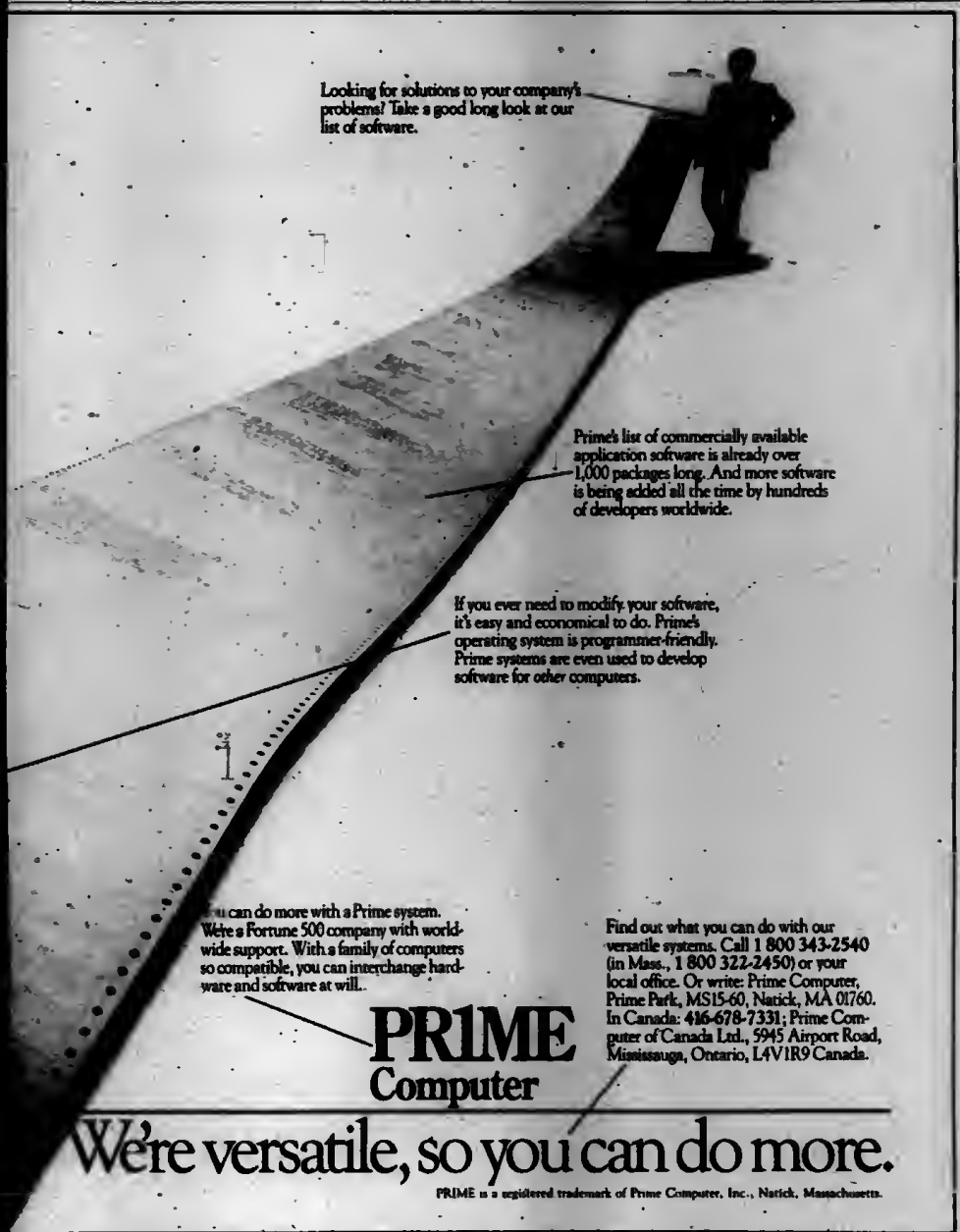

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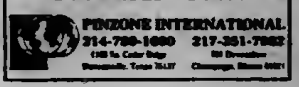

SOFTWARE & SERVICES

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and display file recompiler re-creates programs and display files; member, file and library selection is allowed, the vendor said. An entire source file or library reportedly can be recompiled, if desired.

A data base re-creation procedure is said to re-create physical files and all logicals based on it. Data is preserved, if requested, and all members re-created with correct data sharing among the logicals, the vendor said.

Another procedure is said to correlate source members and their objects. An object source locator finds source information for each object in a library.

Price for each utility is $95 or $500 for the entire package.

Advanced Systems Concepts, Suite S, 1350 Remington Road, Schaumburg, Ill. 60195.

REM ASSOCIATES
Remdoc enhancements

REM Associates has announced that its documentation package for the IBM System/34 and System/36 now includes a Cobol analysis.

The Cobol version of Remdoc contains 20 reports, a subset of the more than 30 reports available to RPG-II Remdoc users. Both Cobol and RPG-II reportedly can be analyzed and incorporated into the appropriate reports.

Reports include nested procedure explosions and system flow charts; field glossaries; file names and label reports showing file access, record length, key length and positions as well as file label information and menu and screen layouts; listings of called programs and subroutines; and programs using external modules.

The RPG-II version also includes report and record layouts plus an automatically generated data dictionary.

Remdoc costs $1,250 and has a 30-day free trial period.

REM Associates, 207 Virginia Ave., San Francisco, Calif. 94110.

TOWER SOFTWARE, INC.
Updated Sleuth/3000

Tower Software, Inc. has announced its latest version of Sleuth/3000, the Cobol debugging system for Hewlett-Packard Co. HP 3000 users.

Sleuth/3000 now traces the results of all executed conditional statements, including nested "if" statements, the vendor said. The programmer reportedly can see the result of all condition testing and follow the flow of control, both within and between procedures.

Sleuth/3000 is said to create a symbolic runtime trace, structured for easy scanning and highlighting all control loops, that reportedly provides an audit trail of each Cobol test run. The package also provides cumulative execution counts, loop detection and a processing summary at the end of the job, the vendor said.

Sleuth/3000 is priced at $2,000.

Tower Software, 328 15th Place, Manhattan Beach, Calif. 90266.

APPLICATION PACKAGES

SOFTWARE INTERNATIONAL CORP.
Pace

Software International Corp. has announced its on-line, interactive Project Accounting & Capital Expenditure System (Pace) to provide construction-in-progress and general ledger tools for the utility and construction industries. It runs under IBM's OS or DOS operating systems.

Pace integrates on-line accounting and financial reporting capabilities with work order management and project control features, the vendor said. Features reportedly include user-controlled capitalization and transfer, complete recap for life-to-date activity, year-end statements and blanket work orders. It provides regulatory agency reporting, rate analysis, rate-case preparation and Internal Revenue Service statements, the vendor said. Pace accommodates automatic consolidations and eliminations, direct and indirect cost allocations, budgeting and performance reporting for project measurement.

Pace is priced at $111,000 for the DOS version and $130,000 for OS.

Software International, One Tech Drive, Andover, Mass. 01810.

OXFORD SOFTWARE CORP.
Maxicalc II

A graphics interface, consolidated three-dimensional worksheets, more flexible reporting capabilities and enhanced system administrator functions are additions to the latest release of Oxford Software Corp.'s electronic spreadsheet software.

Maxicalc II runs on IBM mainframes or plug-compatibles running under IBM's CICS.

According to Oxford, worksheet size has been increased to 64 col. by 999 rows, and the program can now consolidate up to 99 separate worksheets into a workbook.

The package is said to scroll up to four independent windows of data. Worksheet data can be displayed in conjunction with graphics on the same terminal screen, the vendor said.

Maxicalc II now is said to interface with IBM's Graphic Data Display Manager/Presentation Graphics Feature (GDDM/PGF) graphics package and has two new screens for menu-assisted graphics development.

The package also reportedly has the option to password-protect individual worksheets and workbooks.

Maxicalc II is priced at $9,000 for IBM's DOS operating system, including installation, training and documentation, and $12,000 for IBM's OS. Lease plans are available.

Oxford Software, 174 Boulevard, Hasbrouck Heights, N.J. 07604.

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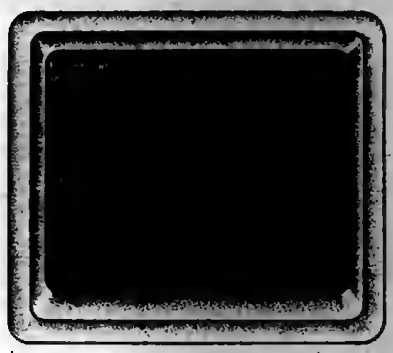

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SOFTWARE & SERVICES

THE BRIDGE, INC.
Trak 2.2

The Bridge, Inc. has announced an enhanced version of its Trak project management software for IBM and IBM-compatible mainframes. The enhanced software operates with IBM's CICS and TSO.

Trak 2.2 reportedly includes improved scheduling techniques that allow "what-if" scenarios, rescheduling for revision of project dates and a project comments capability. It can also communicate annotative comments on project status or other scheduling issues.

The enhanced version is said to provide for greater use of programmed function keys and other enhancements, such as date/task editing routines, time entry controls, program efficiencies and on-line scanning functions.

Base price for Trak 2.2 is $9,500, with lease terms starting at $360/mo. It can be used for a 30-day trial period.

The Bridge, 190 California Drive, Millbrae, Calif. 94030.

LANTOR INFORMATION SYSTEMS, INC.
EZ-Officemation-11

Lantor Information Systems, Inc. has announced an 11-module office automation system for the Digital Equipment Corp. VAX-11 and PDP-11 computers running DEC's VMS, RSX and RSTS operating systems.

EZ-Officemation-11 can be tailored to meet a user's needs, a vendor spokesman said. EZ Desk is the core of the system; additional modules add word processing, time management, formatting, communications, mail, file, document search, security, save and manager functions.

The entire system is priced at $17,500.

Lantor Information Systems, 8055 Manchester Ave., Playa del Rey, Calif. 90293.

TASVIR CORP.
Supercads

Tasvir Corp. has introduced a menu-driven mechanical computer-aided design package that runs on IBM's Personal Computer XT and Personal Computer AT, Digital Equipment Corp.'s VAX-11 computers and Elxsi's 6400 minicomputer. Tektronix, Inc. 4107 or 4109 graphics processors are included for machines with no graphics facilities.

The Supercads relational data base support acts as a repository for all design data and is the prime vehicle for report generation and interactive queries. The package allows users to create a three-dimensional model on the screen using construction primitives. Once the model is constructed, all drawings are fully automatic, the vendor said. Scaling is from one to 1,000,000.

Six standard orthographic views and a standard isometric view are available. The user can rotate an object or model at any angle of the X, Y and Z axes during design. It is also possible to see four different views of the same object at the same time.

Prices are as follows: for a turnkey system of IBM's Personal Computer AT, a Tektronix graphics processor and the Supercad software, $30,000; for Tektronix processor and the software for a customer's IBM Personal Computer XT, $36,000. For a user's VAX-11, a first-station, first-year license and a Tektronix processor is $25,000, with subsequent years at $15,000. A turnkey system of two Elxsi 6400 computers, 16 Tektronix graphics processors with a perpetual Supercad user license, a perpetual analysis program license, a relational data base management system and training for 16 users is $700,000.

Tasvir, 2490 Charleston Road, Mountain View, Calif. 94043.

TESSERACT CORP.
The Rule Manager

Tesseract Corp. has added an enhancement to its line of Human Resource Management Software that allows users easier maintenance of rules required in applications. The enhancement is said to provide interactive problem solving to help users find and correct processing errors.

The Rule Manager has been added to Tesseract's personnel management, benefits plan administrator, claims processing and payroll packages, which run on IBM mainframes and compatible machines using IBM's DOS and OS operating systems. The package reportedly can accommodate thousands of federal and local government personnel rules as well as a company's own personnel policies in more than 32,000 categories.

The software modules are priced from $100,000 to $200,000, depending on the module.

Tesseract, 101 Howard St., San Francisco, Calif. 94105.

SWEDA INTERNATIONAL, INC.
L50 Reporting Software

Sweda International, Inc. has announced an addition to its Retail Information products. The L-50 Reporting Software system is used with Sweda's L-50 electronic cash registers and Sweda's SBS Level 10 computer under Convergent Technologies, Inc.'s Ctos operating system.

The software consolidates retail information from up to 32 L-50 cash registers. Consolidated information includes cash media, sales by clerk, productivity, department by group, and inventory data. It also monitors any L-50 transaction data and performs maintenance to inventory and price items.

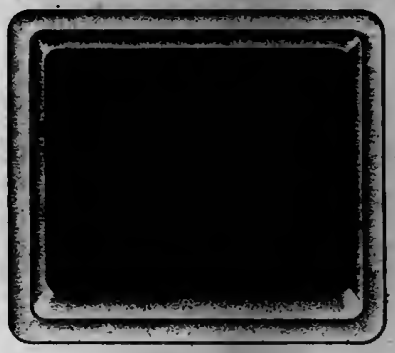
The menu-driven software has Help functions and was designed for noncomputer personnel. The price of the software is $500.

Sweda International, 34 Maple Ave., Pine Brook, N.J. 07058.

See TOOLS page 78

Ditto.

New INTELLECT/FOCUS.



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*FOCUS is a product of Information Builders, Inc.

INTELLECT/SX and INTELLECT/FOCUS run on IBM and IBM-compatible mainframes.

ARTIFICIAL INTELLIGENCE CORPORATION
100 Fifth Avenue, Waltham, MA 02254 617-890-8400

TOOLS from page 77

INTERNET SYSTEMS CORP.
Internet System

Internet Systems Corp. has announced an integrated, modular software system said to manage international banking transactions on Tandem Computers, Inc. fault-tolerant processors.

The Internet System reportedly includes 14 modular applications designed to help banks with international branches manage foreign exchange and funds transfers, handle risk management and accounting, track loans and deposits and process financial and management reports.

It also allows individual banks to interface their computers with international clearinghouses and networks such as the Clearinghouse Interbank Payment System and the Society for Worldwide Interbank Financial Telecommunications, according to the vendor.

The system is said to be time-zone insensitive, allowing interactive transaction processing 24 hours/day, 365 days/year.

It runs on Tandem Nonstop II and TXP computers. The Internet System is written in Tandem languages TAL and Enform and will support user-written programs in Cobol, Fortran, Basic and Mumps, according to the vendor.

The Internet system is available now.

It is priced at $700,000, according to Internet Systems.

Internet Systems, 200 W. Madison St., Chicago, Ill. 60606.

OPTIMUM USER SOFTWARE CORP.
TDS, Mira for DOS

Optimum User Software Corp. has announced that its application software for the financial industry is now available on IBM's DOS.

Originally designed for IBM's OS/MVS operating system, the Opus Master Individual Retirement Account System (Mira), which is incorporated into the Opus Time Deposit System (TDS), features on-line setup, display and update of customer account data and real-time posting for current account status, according to the vendor.

All transactions are edited and posted when entered at a branch or correspondent bank.

The DOS version reportedly has virtual storage capabilities. TDS costs $75,000; Mira sells for $60,000, the vendor said.

Optimum User Software, Suite G-3, Roswell Professional Park, 11205 Alpharetta Highway, Roswell, Ga. 30076.

TRANSCOMM DATA SYSTEMS, INC.
Tolas Version 6

Transcomm Data Systems, Inc. has announced Version 6 of Tolas for Digital Equipment Corp. VAX-11 CPUs.

Version 6 is the first version that uses standard DEC Record Management Services operating under DEC's VMS operating system, the company said.

With Version 6, users can now use DEC layered products such as Datatrieve, the Common Data Dictionary and the Decnet and Vaxcluster technologies.

Tolas modules include order entry and invoicing, inventory management, purchase order management, sales analysis, accounts receivable, accounts payable, financial reporting and fixed assets.

For remote customer or salesman input and inquiries, Tolas modules can be integrated with Tolas Salesstream, according to the company.

The price for Tolas Version 6 depends on CPU model and module, with the range per module being $3,000 to $26,000.

Transcomm Data Systems, 1360 Old Freeport Road, Pittsburgh, Pa. 15238.

SYSTEMS ASSURANCE CORP.
Fastpac

Systems Assurance Corp. has unveiled a version of its automated insurance processing and administration software system for small property and casualty insurance companies.

The version, called Fastpac, runs on IBM System/36

Continued on page 80

Data Processing

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INFORMATION CENTER ANALYST

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For more information call: Roger Cox at (203) 762-2511. Or drop your business card into an envelope and mail it to Roger at: D&B Computing Services, 187 Danbury Road, Wilton, CT 06897

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SOFTWARE & SERVICES

Continued from page 78

Model 5362 computer under IBM's SSP operating system.

Fastpac enables the small insurer to automate policy ratings, billings, renewals, claims, filings and reports. Fastpac features include menu-driven screen prompts, an integrated commercial data base management system, on-line terminal processing and modularly engineered security files with source rights.

The price of the Fastpac system ranges from $50,000 to $100,000.

Systems Assurance, P.O. Box 237, 16 Lafayette St., Yarmouth, Maine 04096.

THURMAC FINANCIAL AND DATA SYSTEMS

Account Analysis and Float; Call Report System

Thurmac Financial and Data Systems has announced two packages for use with NCR Corp.'s Banker 80 banking system.

According to a spokesman, the integrated Account Analysis and Float package uses account data from the Banker 80 data base to produce profit and loss data for commercial direct deposit accounts. Its features include daily float report, profit/loss per account, combined analysis, customer analysis statements, alpha profit/loss report and on-line analysis.

Thurmac's Call Report System is designed to simplify preparation of the Call Report required by the Federal Deposit Insurance Corp. and state and federal governments. It uses existing account and general ledger information in the Banker 80 system to prepare the required reports. According to the company, the system is designed to be set up on a one-time basis, and reporting thereafter is automatic.

Both packages are written in ANS Cobol and operate on any NCR mainframe. Account Analysis and Float is priced at $2,950, and Call Report System is priced at $2,750.

Thurmac, Suite 426, 22704 Ventura Blvd., Woodland Hills, Calif. 91364.

MANAGEMENT DECISION SYSTEMS, INC.

Express enhancements; Easycast

Management Decision Systems, Inc. (MDS) has announced enhancements to its Express product. Express is a data base management system for decision support and applications development on any IBM mainframe running under IBM's VM/CMS operating system and on any Prime Computer, Inc. system running under Prime's Primos operating system.

The Express language has been internally restructured to decrease CPU utilization and memory paging, the vendor said. Other enhancements include full screen data entry and editing, an integrated forecasting package, graphics improvements and interfaces with SAS Institute, Inc.'s SAS, Information Builders, Inc.'s Focus, Informatics General Corp.'s Answer/DB and IBM's ISPF.

The price of the Express system is $85,000.

MDS has also announced a sales forecast system for marketing and production managers that runs on IBM mainframe computers under VM/CMS and on Prime computers under Primos.

The menu-driven Easycast package can be customized for sales trends, seasonality, strategic influences and cyclical effects. A security system protects the confidentiality of the user's information.

The price of Easycast is $120,000.

MDS, 200 Fifth Ave., Waltham, Mass. 02254.

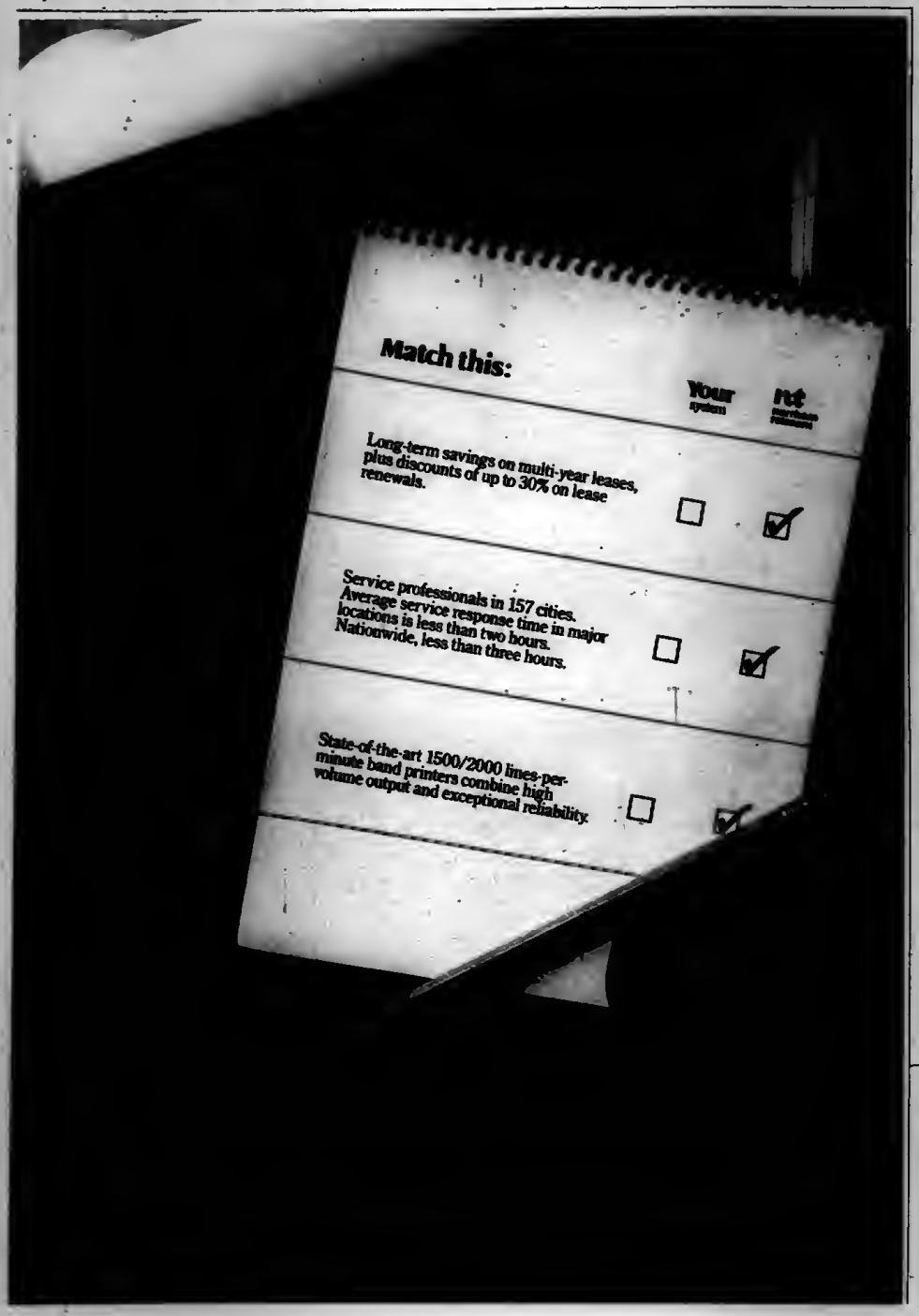
INFORMATICS GENERAL CORP.

Disbursement Interface; Accounts Payable II

Informatics General Corp. has announced two software systems designed for law firms.

According to a spokeswoman, the Disbursement interface system interfaces disbursement charge recording devices with the Informatics Legal Time Management System on Wang Laboratories,

Continued on page 83



A UNIVERSAL SOLUTION for Large Data Center Limited-Distance Multiplexing see pg. 92

Fibronics

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DunsPlus gives the IBM PC XT a built-in business environment. This lets you mold DunsPlus to fit the way you do business.

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AUDITOR from page 69

follows up on the auditor's recommendations. Such an audit should include recognition of the strengths of the organization and its resources and should address those areas where improvements are feasible and potentially beneficial.

The selection of the auditor may not be in the hands of the information systems manager, but I would hope he has enough influence to affect the choice. The auditor should possess extensive data processing management experience in order to evaluate properly the information systems department. He must also possess good interpersonal skills in order to gather and interpret effectively the facts and opinions about the information systems group and its practices without becoming entangled in a web of detail.

Some companies have a staff of internal auditors who are primarily interested in the accounting-related use of data processing and rarely possess the experience needed to evaluate the information systems department accurately. Outside auditing firms may not have someone with the experience to perform this function properly. Sometimes vendors offer this type of service also. Many companies call on experienced independent consultants to conduct an in-depth review.

The audit should initially provide broad coverage of the information systems activities and concentrate on a few areas that offer the greatest potential for improvement. Subsequent periodic audits can review progress and add other categories for study.

A list of the major subjects for audit should include personnel, hardware/software, applications development, data center operations, user relations and management policies and practices.

Examine organization

The auditor should address whether the information systems department is properly organized. The size of the department, services provided, technology employed, scope of functions and other factors should be considered in determining the best approach for distributing and delegating responsibility. Separation of duties will enhance security, but accountability will minimize costs and improve productivity.

The information systems manager probably knows already where personnel problems exist. The auditor can be very helpful in providing evidence to confirm or deny the suspicions. Recommendations for counseling, additional training, transfer or dismissal should be expected from a qualified auditor. If there are simply not enough people to do the work, the auditor's recommendations for staff additions will often influence upper management in ways the information systems manager cannot.

The capacity and effectiveness of the hardware is, of course, a key factor in providing acceptable service to the users. The review should determine the present demands on hardware and related resources and gauge the limits of the capacity in order to predict when an overload will occur. The audit should review capacity planning and performance monitoring practices to determine if this area of the department needs improvement.

The efficiency and cost-effectiveness of the information systems function is often determined by staying relatively current with technology. It is no easy decision to convert to a new operating system, language or package. But to fail to bite the bullet will often result in the department digging a deeper hole. Whether upper management understands it or not, attracting and retaining top quality computer professionals is directly related to the age of the technology employed.

Set standards

The success of the applications development group can be greatly enhanced by standards. The auditor should look into how user needs are determined, priorities set, staff assigned, systems designed, programming performed, documentation prepared and applications implemented. Remember that applications should not only perform properly, but should also be maintainable.

The operating policies and practices of the data center are prime candidates for review by a qualified auditor. Investigations may include data entry, job scheduling, service goals, measurement of service, delivery of output, wasted motion, control of the media library, backup and recovery, disaster contingency plans, data and physical security, budgeting, chargebacks and user communications.

The information systems manager should insist that the auditor spend time interviewing users. The goal is to elicit an honest and fair evaluation of services being received. However, this should not become simply an outlet for users to vent complaints. The auditor must document specific problems and identify needs that are not being met. Proposed solutions should be stated.

An auditor should be concerned with the department planning and budgeting policies along with the methods used to control costs and to evaluate, compensate and motivate people. The use of appraisal and counseling systems should be addressed. Long-range planning for major resources is often ignored until it is too late.

And lastly, an important area in which an auditor can help is in judging the effectiveness of communications within the information systems area. Often the most serious problems in a computer service organization can be traced to the lack of effective and timely communication between managers and subordinates.

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††MBASIC is a trademark of Microsoft, Inc

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PHILON™

SOFTWARE & SERVICES

Continued from page 80

Inc. VS computers. The Disbursement Interface system allows a law firm to control, record and report resource use by client when used with charge recording devices for telephone, photocopier and postage meter systems.

Data stored by a recording device is automatically transferred to the Legal Time Management System. Raw data is sorted into client, matter and attorney sequence to produce a validation and summarization listing. Final posting is made to the work-in-progress file in the Legal Time Management System.

Informatics' Accounts Payable II system for law firms is integrated with the Legal Time Management System and the company's General Ledger on Wang VS computers. It allows a law firm to select from three options when choosing an appropriate accounting basis: cash, modified accrual and accrual.

Standard functions include batched and on-line check printing, master files for each vendor and multiple accounts payable companies, up to five categories of invoice transactions and automatic vendor payments selection.

The Disbursement Interface system is priced between $6,000 and $10,000, depending on the number of users. The Accounts Payable II system is priced between $5,500 and $10,500, depending on the number of users.

Informatics, 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

NCA CORP.
Maxcim Version 3.0

NCA Corp. has announced a new release of its Maxcim Materials Requirement Planning II (MRP II) manufacturing/financial software designed for manufacturing operations planning and control. The Maxcim system runs on all Digital Equipment Corp. VAX-11 computers running under DEC's VMS/RMS-operating environment.

Maxcim now features access by DEC's VAX-11 Information Architecture software such as Datatrieve and compatibility with DEC's office automation system, All-In-1.

The price of this version of the Maxcim system ranges from $125,000 to $185,000, depending upon the chosen modules and options.

NCA, 3250 Jay St., Santa Clara, Calif. 95054.

AUTOMATION TECHNOLOGY PRODUCTS
Cimplex factory automation modules

Automation Technology Products has announced a set of modules for the automated factory environment. The modules run on IBM's 4341 and higher computers running under IBM's VM/CMS operating system.

The Cimplex Mechanical Parts Design module can generate edges, holes and recesses as well as forms that are symmetrical or have protrusions. It also has a catalog of primitives for design advancements, the vendor said.

The Cimplex Mechanical Parts Analysis module generates finite element meshes according to the analyst's specifications, and analysis parameters can be set. Thermal or force criteria are defined on the part's surface geometry instead of the mesh. The software creates graphics of stress contours on the deformed part.

The Cimplex Mechanical Parts Manufacturing module has interactive two- to five-axis capability for multipath pocket milling, standard and free-form cutter libraries, a parametric library and facilities for process planning.

The minimum annual license fee for an individual module is $40,000, and the modules are offered separately when applicable.

The Factory Automation Information Management software includes active monitoring, automatic change control and notification and uses conventional relational data base management concepts for computer integrated manufacturing.

The license fee for the Factory Automation Information Management software is $100,000.

Automation Technology Products, 1671 Dell Ave., Campbell, Calif. 95008.

PRIOR DATA SCIENCES LTD.
GKS/C

Prior Data Sciences Ltd. has announced the North American distribution of GKS/C, a C language imple-

Continued on page 84

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D

AVCO from page 69

1983 and fully implemented it within six months. Improvements were evident immediately, beginning with the elimination of more than 2,000 card decks, Salvatore said. As a result, JCL override problems were reduced dramatically.

"Before UCC-7, job overrides often were forgotten until a job was run and the mistake was noticed," he said. "With UCC-7, overrides can be handled easily through a system terminal. We have the flexibility of scheduling an override for the next cycle, for a specific time range or for specific production runs."

Using the features of UCC-7, such as work load forecasting, performance tracking, reporting and job triggering, Avco Lycoming has saved at least 70% of the time previously required to schedule jobs, Salvatore said. The work load can be defined one time, and UCC-7 automatically schedules the work.

One of the important UCC-7 features for daily operation at Avco Lycoming is work load forecasting. With it, the DP staff can check the schedules for the next week, month or even year. With the previous undocumented system, scheduling was the responsibility of one person who decided what job ran and when, Salvatore said.

"Another feature — performance tracking and reporting — provides daily reports on the jobs completed, the time required for each job, the severity levels and the validity of the schedule," he explained. "We now can adjust our daily schedules for optimum performance."

Performance has also been improved through UCC-7's automatic job triggering feature, Salvatore said. For example, work flow control previously was disorganized, with jobs seldom arranged in an established order. Often an operator was not sure which job ran or which job had to be run before another could begin. Automatic job triggering eliminates the guesswork.

To improve scheduling further, Salvatore and his staff selected the UCC-11 package in September 1982. "A major factor that prompted the purchase was the capability of automating restarts," he noted. "We didn't have automated restart procedures, so any job that abended had to be handled manually. This included data set and catalog maintenance, plus modifying the card deck. UCC-11 now handles all of that and saves a great deal of time because many jobs are lengthy, and restarts take time to set up."

In addition, because some of Avco Lycoming's applications software is outdated, Salvatore's staff is isolating those that need immediate attention. One way to do that is with the reports provided by the Uccel product.

By studying the daily reports UCC-11 generates, Avco Lycoming's data center staff can track any problem trends that develop in specific systems by checking such information as abend or spoilage ratios.

"The UCC-7/UCC-11 interface provides easy access to UCC-11 through a UCC-7 system terminal," Salvatore said. "That has saved time for the operators who have to rerun a job. Going through a UCC-7 terminal, all the UCC-11 restart information is on the preformatted screen in front of them."

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mentation of the Graphics Kernel System standard that runs on AT&T's Unix and Unix-like operating systems.

According to a spokesman for Prior Data Sciences, GKS/C is currently available for Motorola, Inc.'s MC68000 microprocessors and Digital Equipment Corp.'s VAX-11 systems running under the Unix operating system.

Written in the C language, the software provides graphics capabilities that range from simple passive output to interactive applications and that will control a variety of graphics devices, according to Prior Data Sciences.

GKS/C reportedly makes use of a variety of graphics primitives, some of which allow users to address special raster tube effects and control access to special workstation characteristics.

Each graphics primitive has associated attributes, such as color.

Groups of primitives, which are called segments, can be dynamically scaled, rotated, flashed and made visible or invisible, according to Prior Data Sciences.

According to the company spokesman, single-CPU pricing for GKS/C software starts at $2,000. Multiple-CPU pricing for the GKS/C software is said to begin at $10,000 plus $300 per CPU.

Prior Data Sciences, Suite 232, 39 Highway 7, Ottawa, Ontario, Canada K2H 8R2.

DEC from page 69

is said to maintain all product and production information for the system. The module maintains the bill of material, routing and work center information and builds on information already created. The Shop Control and Costing module is said to help eliminate repetitive tasks of production management, such as daily scheduling. The module tracks work-in-progress; feedback reporting and cost deviations. It also provides accounting for material, labor and overhead consumed by the order during the production cycle.

Additional software for accounting can be purchased separately for $1,500 to $2,000 per module. The price for a typical Decsp manufacturing system is $33,000, DEC said.

More information is available from DEC, 146 Main St., Maynard, Mass. 01754.

IN DEPTH

Electronic banking

Every manager's business

By Jerome Svigals

If you have bills to pay and funds to manage — and every corporation does — you should be concerned with the evolution of the banking business. DP and MIS in all industries must put in place systems to assist financial officers in cash management and product managers in sending purchase orders electronically.

Electronic banking is generally defined as a combination of financial services and delivery mechanisms that are implemented without the use of paper or labor-intensive activities. The major building blocks for electronic banking are:

- Self-service banking.
- Branch automation.
- Remote banking services (implemented by communications to nonbanking locations, such as home banking).
- Network services (implemented through

networks to other banking locations — includes cash management services such as cash reporting, cash movement and cash control).

- Interbank services (where information and funds are moved to banking institutions for extended services. The Swift international banking network, used by multinational corporations, offers such services).

By some measures, electronic banking is well-established in the U.S. Each day the total of network wire transfers in the country has a value of $500 to $600 billion. Some banks are electronically transferring daily a dollar value that equals two to four times their total deposits.

The Federal Reserve Board is very concerned about this situation. Banks that move huge amounts of funds through electronic banking may not be able to settle or pay for the transactions at the end of the day.

This imbalance is referred to as "daylight overdraft." The Federal Reserve Board is now holding hearings on capping the dollar value of funds that an institution can transfer before it is required to pay the settlement bill at the end of the day.

There is another definition of electronic banking. The National Commission for Electronic Data Processing Systems once defined electronic banking as those electronically based services that allow financial service institutions to circumvent the regulatory authorities. In the U.S. today there are numerous examples that support this description. Interstate banking is on the rise because of the ability to transfer funds through automatic clearing houses. Access to funds is achieved through shared and interstate automatic teller machine (ATM) networks and through other communications-based banking facilities.

Perhaps the biggest success story in electronic banking is the acceptance and continued growth of the ATM (a cash dispenser plus depository) and the simpler cash dispenser. In the U.S. today, there are some 45,000 ATMs. This installed population is growing at approximately 30% per year. Worldwide, there are now more than 126,000 units. To operate these units, magnetic-stripe bank cards and personal identification numbers are required. By 1985, close to one billion magnetic-stripe cards will be used for self-service and point-of-sale transactions around the world.

In order to take advantage of the new electronic banking systems, there are three primary technologies that must be built into conventional data processing and MIS systems: workstations, bank cards and communications alternatives. Each of these technologies is experiencing rapid growth.

The fact that users are embracing these tools, combined with announcements of new banking services and an improved economic outlook, augurs well for the general acceptance of electronic banking. But there is still a long way to go. Today, 85% of all banking transactions are paper transactions. This percentage is decreasing, but because the total number of transactions is growing at a healthy rate, the total of paper transactions continues to increase.

Pressures on banking industry

The progress of electronic banking is encouraged and, at the same time, impeded by a number of internal and external pressures. Deregulation has increased competition and changed the rules of how business is conducted. As regulatory constraints are lessened or eliminated, we are seeing more interstate regional banking agreements.

Such agreements have already been made in the New England states and in the Southeast. Agreements are being discussed in the Middle Atlantic and North Central states. In addition, several large banks have been allowed to move interstate in order to acquire failing institutions. These moves include Citibank's entry into California, Florida and Illinois and Bank of America's acquisition of Seattle First in the state of Washington.

The tradition of limiting banking within state boundaries has been relaxed further by the nature of the new electronic services. With home and remote banking and such services as shared interstate arrangements for ATMs, it is impossible to enforce the old regulation.

As new territories open up, most major banks in the country today are redefining their customer, service and geographic market opportunities. There are many nontraditional services now offered by branch banks, such as executing brokerage orders. Although the Glass-Stegal act prohibits banks from acting as brokerages, the banks circumvent the law by acting as a communication channel to a brokerage firm owned by their parent company.

This kind of competition runs both ways. A number of major firms have been attracted to the bottom-line business potential of financial services. Sears Financial Centers, for example, combine real estate, brokerage and, in some states, banking services — all under the Sears Roebuck & Co. logo. Other retail, industrial, insurance and brokerage firms have entered the arena, offering traditional banking services such as mortgage lending, money management, consumer financing, leasing and industrial lending.

National deficit

Another potential threat to the banking industry is the national deficit. To finance the deficit, government must compete with the private sector for funds. This competition may pressure the banking industry into raising the cost of funds. In order to reduce interest charges, the

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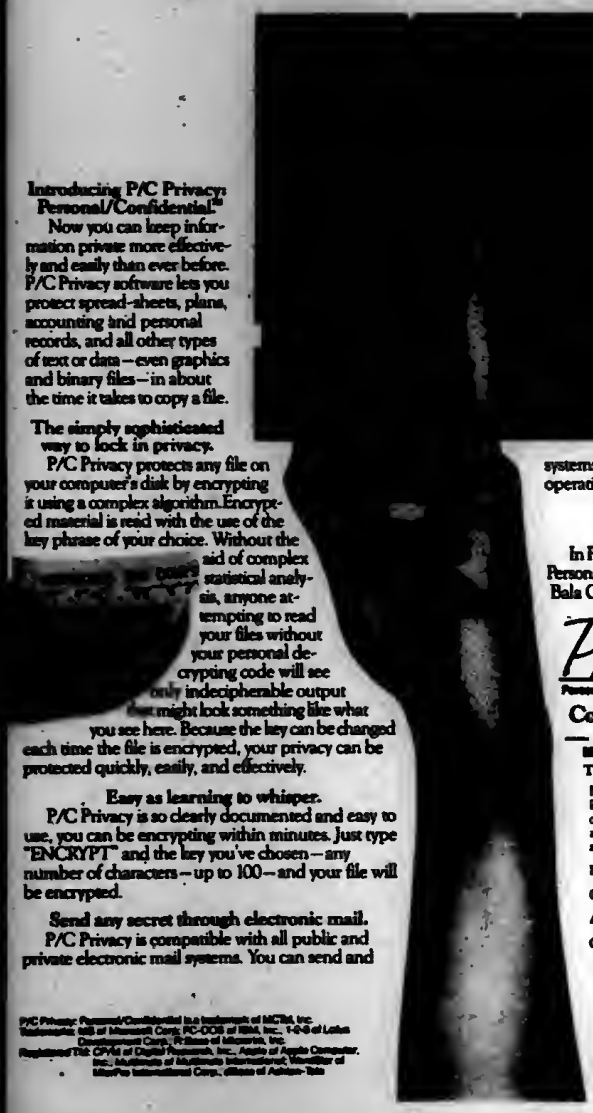

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industry may have to employ electronic banking systems that more readily capture the time factor and value in large transactions, quickly update pertinent customer and settlement data bases and move the transaction into the interbank network system.

In addition to the external pressures on the industry, there are a number of internal problems that are forcing banks to reexamine how they deliver services. As a result of deregulated interest rates, banks are paying added interest income on conventional accounts.

At the same time, the interest rates that the finance industry may charge for loans are shrinking because of intense cross-industry competitive pressure. Hence, the industry is experiencing a reduction in interest income.

This loss of income is compounded by decreasing balances in large corporate accounts. By using such electronic banking services as cash management, many corporations are learning to manage cash flow more effectively. Zero or negative balance deposit accounts are becoming more common. As a result, banks are losing large compensating balances. Capital for branch construction or expanding services is more difficult to come by, and banks are pressured to reduce capital expenditures.

Since banks must reduce the cost of doing business and increase market and geographical coverage, we are seeing more mergers and consolidations. In theory, a merger provides a larger economy-of-scale opportunity to share and, therefore, reduces expenses. Unfortunately, when the participating institutions are operating inefficiently, the economy of scale after the merger compounds, rather than solves, the problems.

Personnel costs

One major area where banks need to tighten the belt is personnel. Last year, a period of relatively low inflation, personnel costs rose 10% to 15% because of increases in benefits such as Social Security and medical insurance. If this rate were to continue, personnel expenditures would double within five years. Electronic banking, which is not labor-intensive, offers a partial solution.

In today's competitive environment, banks must do a better job of anticipating and preparing for change. The amount of time required for data processing to develop and implement new systems poses a serious constraint, and it is essential to plan for adequate lead time.

Some banks are easing the burden on DP by encouraging direct end-user applications and by participating in joint industry implementation packages and operating systems.

Another alternative is to create self-contained business units that are responsible for their own data processing, facilities acquisition and profit and loss.

Trends and opportunities

As banks move to reduce expenses and improve revenues, more self-service and card and check alternatives are introduced, leading to a significant rise in productivity. ATMs are affecting the growth curve of paper-based transactions, as are communications-based technologies. Customers are paying phone bills with a phone call, and corporate treasurers are sending cash management instructions via terminals or intelligent workstations.

The amount of time required for data processing to develop and implement new systems poses a serious constraint, and it is essential to plan for adequate lead time.

Branch development is a second area where changes are leading to productivity improvement. Conventional bank branches are being restructured. The trend is toward smaller facilities that have extended hours (up to 24 hours per day, seven days a week), where "counter" transactions normally handled by tellers are offloaded to ATMs in an outer lobby.

The new ATM functions include check reading and coin dispensing. A number of these high-productivity branches are staffed with marketing/sales personnel during normal business hours. Since the new facilities are smaller and have fewer tellers, they require less capital for operations, are easier to build and are also portable — they can be dismantled and moved to a new location.

High-productivity branches are getting a good deal of testing and exposure. If these branches are given the proper location, they are generally accepted by the public.

There is still a need for large city center branches and conventional "brick-and-mortar" branches in business activity centers. The high-productivity branches will be established in new suburban areas, shopping malls, industrial complexes and other areas that do not justify the existence of a full-service branch but do require around-the-clock services and transaction access.

A third area of productivity improvement is network-based services, such as remote or home banking, where financial transactions are made by the customer at his own facility. The customer takes over the job of entering data and validating transactions under application-supervised programs.

One of the most widely used communications-based services is cash

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management. Cash is deposited across the nation by local branches of large institutions (public and private) and by retail outlets of large chains. A corporate financial officer uses an on-line terminal to access his data base in the cash management bank. He can review the previous day's deposits, issue instructions to assemble the cash in money center banks and exercise mathematical models to assess cash flow.

Is it above or below plan? Does he need to borrow on short-term, or does he have surplus cash to invest? He can then issue instructions, via his terminal, to move the cash into loan or investment options or to disperse the cash for payroll or supply payments. With electronic networks, the financial officer can assemble a nationwide picture of corporate finances within 24 hours of cash events.

Home banking

Home banking is another communications-based service that is getting a lot of attention. Several large systems are being installed around the world: Prestel and videotex in England, the Bank of America system in California and Chemical Bank's Pronto system in several states.

Actually the term "home banking" is a misnomer. The majority of users in most of these systems are not the retail banking home accounts. Rather, they are retailers, professionals, business branches and small businesses. Hence, "remote banking" is a more accurate descriptive term. These systems offer extended hours, convenient locations and avoid energy use for travel to a banking location.

Other communications-based services include wire transfer, such as the movement of funds between national and international accounts, and ATM interchange or sharing, where the customer of one bank may use many ATMs around the country.

As customers grow more sophisticated, they expect to have access to funds on a broad geographic basis. Customers expect to be able to issue instructions for their funds to be moved rapidly on an electronic and paperless basis.

The one glaring problem with communications-based banking is that too many products are being offered as separate efforts, with no overall integration of design. Services are implemented with telephones, videotex, personal computers and other methods. This results in redundant efforts by systems development and, consequently, increased costs.

Another strategic part of systems development in banking is the migration from batch to transaction processing. In today's banking systems, customer records are updated overnight on a batch basis.

Electronic banking, however, demands some direct posting of transactions. Each transaction, when initiated by a communications message, must be supported by extensive data base updates. These data bases include the customer's record and customer's inquiry file, the customer's billing record, the bank's funds position, its foreign exchange position and the network controls.

The time periods during which these postings occur are becoming more narrow. The Federal Reserve Bank's concerns about daylight overdrafts may result in industry rules that require settlement over shorter time periods.

If this happens, banks will need to move to transaction processing in order to make their consolidated settlement

The one glaring problem with communications-based banking is that too many products are being offered as separate efforts, with no overall integration of design.

How to be in 16 places

The time periods during which these postings occur are becoming more narrow. The Federal Reserve Bank's concerns about daylight overdrafts may result in industry rules that require settlement over shorter time periods.

within the allowable period.

This migration in processing and the new network services must be justified by the bank's operations manager and product developers. In order to justify a new package of services, they must show the business use of the package, demonstrate it as a competitive tool and, most importantly, show why the new services will appeal to the customer.

Their strategic planning must take into account systems and communications resources in order to make the best possible use of the finite and expensive application development resources of the bank. If DP and MIS managers are given advance notice of development plans, they can consider purchasing commercial programs from outside the bank or organize joint development efforts within the bank or with a group of banks — all of which can save time and money.

Strategic planning should also include a policy on personal identification numbers (PIN). Many of the new bank services require that customers be willing to ask for and use magnetic-stripe cards with PINs. These services include ATMs, point-of-sale machines, paperless teller transactions, remote banking and shared or interchanged banking.

Uncoordinated effort

Because each of these services is generally provided by a separate bank product group, the issuing of PINs is an uncoordinated effort. Should the customer or the bank select the PIN? The general consensus is that using customer-selected PINs may be the most efficient, since the customer will tend to choose the same PIN for all the services he uses. If this is not the case, then the bank should limit the number of PINs issued to one customer.

An effective security program is another item that planners should consider. As more electronic banking networks come on-line, the value of dollars transmitted continues to grow, making these networks an attractive target for fraud. There are many people with access to these systems and networks, many access points and a variety of attack scenarios (messages can be interjected, and amounts can be changed).

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design of new systems. To protect existing systems, the industry has instituted new standards. The message authentication check (MAC) standard (ANSC X9.9) protects wire transfers. There is also a standard that comprehensively covers the requirements for PIN management and security (ANSC X9.8).

All banks should develop an architecture and security philosophy that clearly designates responsibility. An effective security program requires a designated architect, an implementation plan that has the support of auditors and continued testing with important sensitivity controls to ensure that the unexpected and unknown is not occurring.

Future challenges

In the next few years, technology will open new avenues in electronic banking. The smart card, a bank card with an added logic and storage chip, offers new opportunities in security, portability and system architecture.

The new communications alternatives — including local-area networks, wide-area networks, metropolitan area networks and value-added networks — will contribute to the evolution of electronic banking. Furthermore, there are a number of network design and business options: dedicated and proprietary networks, shared and interchanged networks and analog and digital-based public switch network systems. All of these options will be examined for cost-effectiveness and introduced in tandem with communications-based services.

The industry is currently testing techniques to augment PINs. Optional methods for personal identification verification are necessary because only 50% to 65% of the customer base is receptive to using PINs. The new methods being tested include hand geometry, signature dynamics, eye retina scanning and fingerprint reading.

The evolution from batch systems to transaction management systems is another major challenge for the industry. This change requires considerable investments on the part of management in timing and justifying the huge cost for the transition.

Electronic banking has opened up many new and desirable capabilities for the conventional banking industry. The use of ATMs, automatic clearing houses and point-of-sale systems are all contributing to a significant reduction in the growth curve for paper-based transactions.

Electronic banking today is handling 80% of the value of all financial payments, but by volume it has only penetrated 15% of payment transactions. The bulk of financial transactions are still paper- and labor-intensive.

Eventually, we will reach the point where the paper curve turns down and electronic transactions become the major form of banking. In order to reach this goal, MIS and DP managers in banks need to help product development and marketing departments understand their future opportunities.

Within financial institutions, user groups and system groups must communicate effectively and coordinate their efforts in order to take advantage of the true economic and performance improvements associated with electronic banking.

DP and MIS managers in other industries will need to understand their payment options and gain a firm grasp of the new banking services in order to get the best capital and financial performance.

About the author

Jerome Svigals is vice-president and strategic planning officer at Bank of America. He leads a seminar titled "Evolving to Electronic Banking" for Technology Transfer Institute, Santa Monica, Calif. The next seminar is scheduled for Nov. 14-16 in San Francisco.

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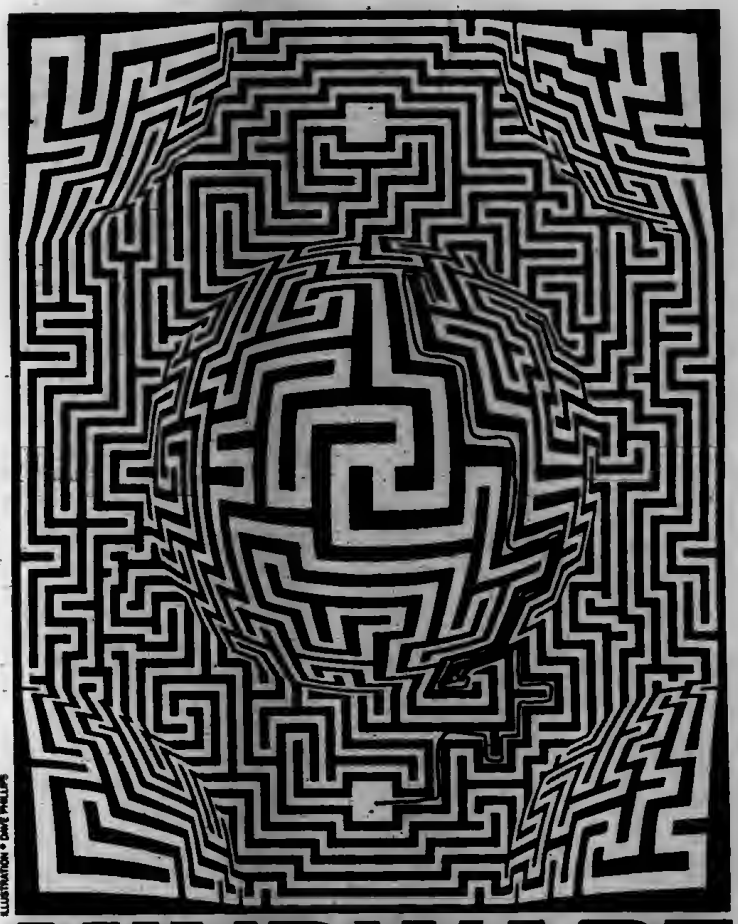

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MINDWARE

Spreadsheets for ideas

By James Haner

Mindware permits users to utilize the personal computer as an "information appliance," a tool to put down thoughts and ideas in a random order and then sequence them by keyword or similar lists in outline form. This software extends a user's personal thought process.

Software can overlay form onto ideas. For your thinking pleasure, here are Thinktank, Brainstormer, the Idea Processor, Thor and Maxthink.

These spreadsheets for ideas are perfect for writers and ideal for business users and students who seek to improve their ability to think, create, plan and solve problems.

This review explores some particular products in this somewhat revolutionary software category. I am excluding here the knowledgeware type of software (such as Participative Management Skills from Concourse; The Sales Edge from Human Edge Software Corp.; and Assessing Personal Management Skills from Thoughtware, Inc.). These programs tend to help users with text and numerical data in decision support simulation areas and are not "idea processors."

Five aids for organizing ideas are: Thinktank, Brainstormer, Thor, the Idea Processor and Maxthink.

Thinktank is billed as an idea

processor. It is better called an "idea organizer" or "outline processor." Basically, it aids the outlining process by setting up traditional conceptual outlines with major topic headings and indented subtopics and sub-subtopics. The arrow keys are used to move your ideas between any heading and subtopic. Thinktank will keep track of your items by indenting as you go along. A text paragraph can be associated with each heading.

The program provides a reasonably sophisticated editing and modifying capability. In addition to basic editing commands, Thinktank has a useful search and replace feature. It also has the ability to move, rearrange and revise any heading and subheading.

Thinktank is a good vehicle to organize thoughts and ideas about a subject. It is useful in creating conceptual outlines for memorandums, letters and articles. It can also double as a way to organize "to do" lists, project plans, research notes, action items, sales meeting agendas and any other lists of tasks. Various printing formats are provided (table of contents, numbering, lettering and others). Text can be imported and exported to and from other programs in a Wordstar format.

Brainstormer is a tool to aid in the development and organization of ideas. It is easy to use and a good example of the new mindware software. Broad problems are broken down into 10 or fewer themes. Then up to 10 alternative solutions to each theme are requested.

An example of a theme is: Sales are starting to lag. Why? Some likely questions Brainstormer would prompt you to ask are: Who are the leading salesmen? What are the best selling products? What markets are selling best? Then the program offers you "probes," possible alternatives that combine parts of the problem and solutions in various ways. If you supply the appropriate responses to the themes, Brainstormer will give you ideas to solve your sales problem.

Alternatives can be weighed according to likelihood to make the brainstorming process a little less random. Otherwise, the program will suggest thousands of ideas for even a simple problem. Brainstormer does not suggest which combination of ideas is the best or most creative. That task is left to you.

Brainstormer can help find creative solutions by exploring a nearly limitless variation of a fixed number of themes. The real power of Brainstormer is its ability to throw out numerous variations randomly. It is guaranteed to shake you out of the same thinking rut.

The program is for problems that demand fresh and new ways of looking at ideas. Brainstormer does not draw any conclusions. It will not help you think logically. Strategies for executing the themes are left to you.

Thor is a thought organizer. The program allows you to capture, categorize, review, manipulate and juggle thoughts. Thor permits creative brainstorming without restricting the flow of ideas. You can also organize a mass of material for future inclusion in a document.

Thor is menu-driven. The main menu gives you the option to create a new thought, work with a current thought, set criteria for an idea search, perform an idea search, print thoughts or seek help. A text editor and a data base manager are included. The editor is somewhat limited. You may wish to transfer files to a word processor for the actual writing after the ideas are collected.

Thor is excellent for organizing thoughts. The brainstorming and text organization processes are effectively separated.

Thoughts can be retrieved by name, by matching similar thoughts or by logical operators such as "greater than," "less than," "equal to" and "starting with." The variety of search-and-retrieval methods is a tremendous aid in organizing thoughts. Retrieving thoughts can be

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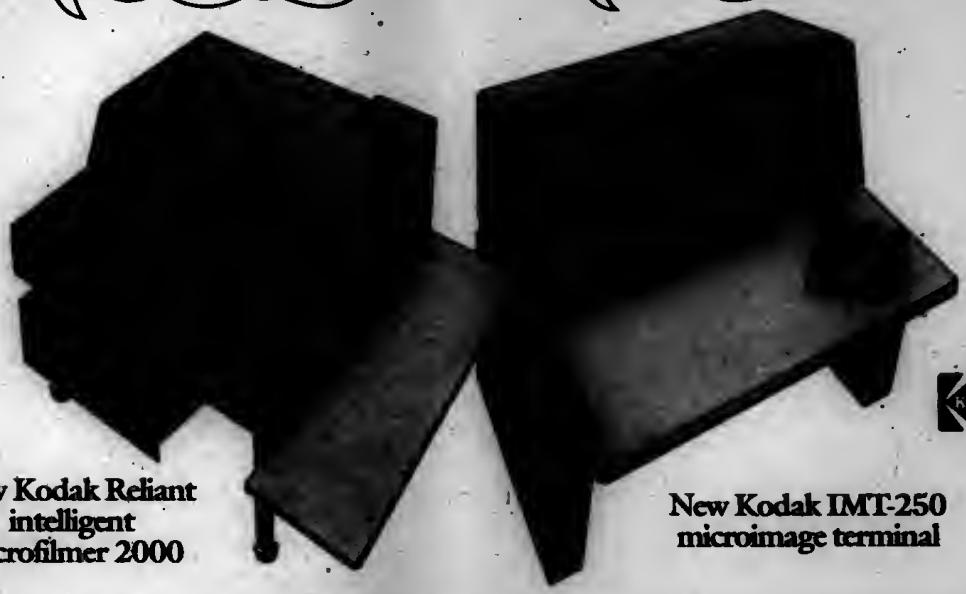

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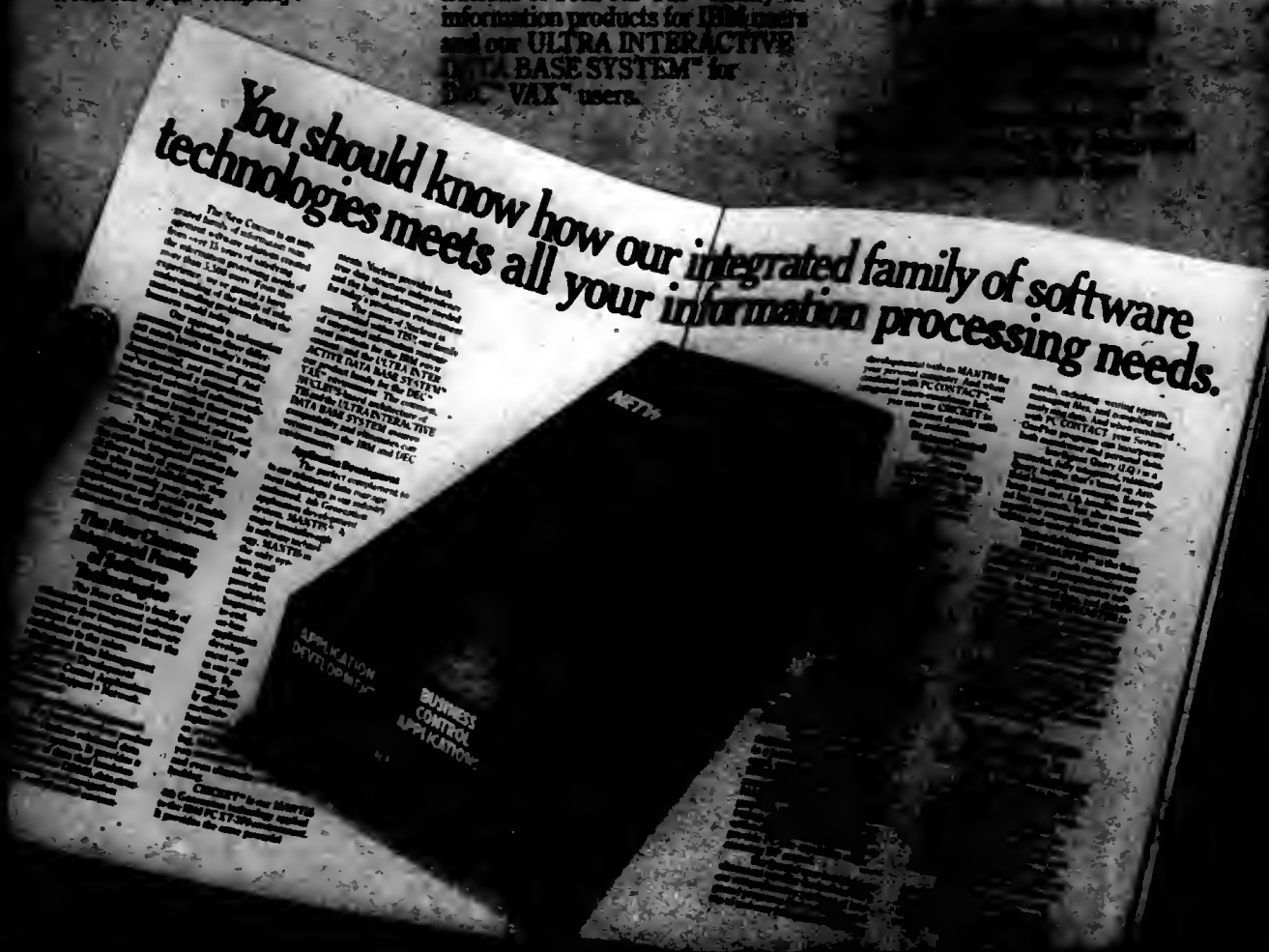

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difficult, but the results are well worth the effort.

Thor is not copy-protected and thus can be used on a hard disk system easily. A hard disk may be a necessity if large volumes of data are manipulated.

The Idea Processor is a combination of word-processor, text data base management system and a keyboard macro generator. The switch from word processor to data base system can be made with a single keystroke. The separation of the brainstorming and thought-collection processes provides for effective thought organization.

The card file (data base manager) is based on the file cabinet concept. You can have 10 file drawers with up to 64K-byte file cards in each. Keywords are assigned to each card file for later retrieval. Logical operators such as "and" or the keywords can be used for card file searches. A real bonus feature of the Idea Processor is automatic text indexing. When files are printed, keywords are dumped into an index file with document page numbers.

The Idea Processor can also save screen images from Lotus Development Corp.'s 1-2-3, Visi Trend, Dgraph and other spreadsheet and graphics software packages. It contains the most effective word processor of all the packages reviewed. The Idea Processor is also not copy protected and thus can be mounted easily on a fixed disk system.

Maxthink includes more than 60 different thought-processing modules you can select from or combine to expand your planning, organizational, creative and decision-making capabilities. Eight modules are designed to help expand personal perception and understanding. Ten modules are included that will help you find and apply new ideas to work or leisure activities. Nine programs that help anticipate the consequences and risks in project planning are available, as are seven programs to help analyze the reasoning and arguments of others.

Maxthink is a word processor with commands that go beyond the normal editing and mechanical formatting of text. Concepts and ideas can be gathered, classified, divided and joined with the added commands and structures. Manuals on effective thinking, writing and planning are included in the package.

The outline-processing commands fall into three categories — thinking, organizing and structuring. "Thinking" commands include synthesis, evaluation, analysis, creativity, grouping, boundaries and naming. "Organizing" commands include joining, dividing and sorting. The "structuring" component features commands for inserting, deleting, moving and copying text.

Maxthink includes editing functions, macro functions and an on-line "Help" function. The "TPL" allows you to define all prompts, messages and menus and has a built-in debugging process.

Maxthink has file-handling capabilities that allow Ascii files to be transferred without control characters. It supports both serial or parallel printers with a variety of print formats available.

The "expand" and "collapse" commands can show any part of the outline on any part of the screen. The program includes a find-and-replace function and several DOS utilities for managing disk files more effectively.

Maxthink comes with a toll-free technical support telephone number and a free monthly newsletter.

The most exciting area of growth for mindware will be in graphics. The 32-bit machines and new graphics capabilities being announced by manufacturers will open up new ways for "software for the brain" to be used. As artificial intelligence programming techniques become more widely used, mindware will see a vast improvement and expansion. Lower cost memory and optical-disk technology developments will also contribute to its growth.

Product	Computers	Price
Thinktank Living Videotext, Inc. 1000 Elwell Court, Suite 292 Palo Alto, Calif. 94303	Apple IIs, 64K Apple IIe, one drive Macintosh, 128K RAM IBM Personal Computer, 256K	$150 $195 $140 $195
Brainstormer Softquote Systems 105 North Adams Eugene, Ore. 97402	TRS-80 Models I, III and 4 Apple II series with CP/M & 80-column, other CP/M & Mbasic 5.2	$60
Thor Platware, Inc. 200 Freeway Drive E. East Orange, N.J. 07018	IBM Personal Computer and compatibles with 192K RAM	$295
The Idea Processor Idea Wise, Inc. 228 Lafayette St. New York, N.Y. 10012	IBM Personal Computer and compatibles with 192K RAM	$295
Maxthink Maxthink, Inc. [illegible] Ave. [illegible] 94610	IBM Personal Computer and compatibles with [illegible]	$249

Five mindware products

About the author

James L. Hauer is an independent microcomputer consultant based in Palmdale, Calif., and founder of the Microcomputer Management Association.

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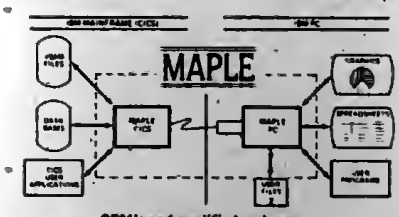

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Interactive Video Information Systems

By Cynthia Schuyler

Ivis — the Interactive Video Information System — is a product born last January out of Digital Equipment Corp.'s own experience, a product that is taking DEC into new markets.

While markets for the product now include training, point-of-purchase merchandising and archival picture storage, original plans were conceived on a much different scale.

The Educational Services Group, chartered to train DEC employees and customers in using and maintaining equipment, was the birthplace of Ivis. In an effort to decentralize training for field service technicians, Educational Services found that a videodisk under computer control could provide motivating, individualized and highly interactive training with 30% to 50% better results than traditional lecture or lab courses.

In addition, when these workstations were distributed to field locations, they saved the corporation the expense of workers' travel to central training facilities. Field

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service technicians could be trained consistently throughout the corporation and take less time away from their jobs.

The concept behind the improved training method is characterized by Del Lippert, corporate vice-president in charge of Educational Services, as "adaptive" learning. The training profession typically looks at a task or job to be taught, lists the information that must be learned by the student, packages that information and then "dumps" it to the student.

Ivis, on the other hand, enables students to learn from a more natural human process — discovery. Using the example of a father who puts together a toy bicycle on Christmas morning, Lippert describes the natural learning process. "How many fathers read the instruction manual from cover to cover before beginning their task?" he asks. "Not many.

The average father will jump into the task until he encounters a problem; then he will reach for the instruction manual to get over the immediate obstacle — and continue until he meets the next problem.

"They use the same process at Harvard Business School," says Lippert, "only there they call it the case study method. I prefer to call it adaptive learning."

The hardware that makes this form of learning possible — the Ivis workstation — consists of a PDP-11 microcomputer (the Professional 350) with hard disk drive, a videodisk player and an interface that mixes the NTSC (video) and RGB (computer) signals for output on a single RGB monitor. Alternate input devices such as a touch screen can be substituted for the keyboard. Individual workstations can be networked via Ethernet to a VAX host, or they can be clustered.

For customers who want to develop the courseware (which consists of a videodisk and the computer program that drives it), DEC offers an authoring system called VAX Producer, which runs on a VAX-11/730 or larger superminicomputer. For customers who don't wish to create their own courseware, DEC has a Custom Courseware Development Service employing design and production experts. The company also offers consulting services to customers needing assistance developing courseware.

The random-access capability of the videodisk player, for example, makes possible the delivery of self-paced, individualized training with interaction complex enough for real-time simulations.

High-resolution TV images with text and graphics highlights can be presented on a "need-to-learn" basis for training or simple information display applications.

With the addition of networking, users can collect administrative data, share files and — in a point-of-purchase application — perform transactions on-line. The range of applications is limited only by the imagination of courseware designers and producers.

The advantages of interactive video training of technicians in decentralized locations have been documented internally at DEC. But experience with initial customers has shown that an Ivis system can solve other problems as well.

One problem faced by customers that presents a clear need is training in high-risk activities where hands-on practice would be either dangerous or prohibitively expensive. Ivis can be used as a simulator or part-task trainer (reducing the amount of time required for hands-on practice by breaking a larger task up into focused parts, each of which may be taught separately on Ivis).

Another use is in the training of highly complex concepts or procedures, when lecture/lab instruction simply cannot take the place of a video and graphics demonstration with user-controlled interaction.

Still another application is training or dissemination of visual information to a high volume of users in distributed locations. With interactive video workstations at each location, a company can distribute colorful, consistent and informative content with consistent quality control.

One early customer, Howell Training Corp. in Houston, has developed a high-risk simulation training application for resale to the petroleum refining industry. In operation, the program is

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Interactive video training operates as a vehicle to teach faster, better responses to operational problems and also as a productivity tool for lower cost production.

actually a simulation of a refinery distillation column, running six times as fast as real time. Ivis controls the simulation, showing schematic diagrams of the control room equipment and numerical readings of the operating parameters (liquid flow, temperature and so on).

The user (in this case a control room operator) is given a task, such as increasing the output by 20%, and must decide which controls to manipulate. The system evaluates his performance and, if it is not up to par, Ivis will switch to a video segment that demonstrates the correct procedure.

At the end of a session, the operator is judged on his percentage of correct answers as well as the simulated cost of his performance (what it cost in dollars per barrel to perform the given task). In this application, interactive video training operates as a vehicle to teach faster, better responses to operational problems and also as a productivity tool for lower cost production.

This hands-on simulation adds a new dimension to Howell Training's lecture/lab course. Positioning the product as an-on-the-job productivity tool creates such an entirely different selling environment that Howell Training has set up an independent subsidiary, Hi Tech Interactive Training, Inc., to develop and market the system.

Another DEC customer, Westinghouse Electric Corp., will apply Ivis to the training of highly complex procedures in the repair and maintenance of military products. In the Technical Training Division of Westinghouse Defense Products, the company provides a range of training options to give customers the technical know-how to maintain Westinghouse equipment.

In an application dubbed "maintenance aiding," Westinghouse offers an on-the-job aid that will inform and direct an inexperienced technician with step-by-step procedures in the maintenance or repair of ground or airborne radar systems.

The system has been configured by Westinghouse as a ruggedized, rack-mounted device for deployment in a military field site. An on-the-job maintenance aid of this type can save the military considerable expense by reducing equipment downtime and increasing the productivity and skill level of its technicians.

An example of a high-volume educational application can be found at Grove City College in Grove City, Pa. This school of 2,200 students plans to use interactive video to change the way it delivers instruction.

The college has completed construction of a facility that could house up to 500 workstations and a production studio for development of the courseware.

Ivis will be used to deliver supplementary material in addition to classroom lecture or, in some cases, to deliver an entire course. The advantages in a college setting are similar to those in industrial training applications.

Grove City College is using the Ivis Ethernet capability to send the results of students' work to a host computer for long-term storage and teacher review. Grove City has also developed a switching system that allows alternate video sources to feed workstations.

About the author

Cynthia Schuyler is a market analyst for the Educational Services Group at Digital Equipment Corp. in Bedford, Mass. Schuyler researches interactive videodisk markets.

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CW-182

SPECIAL REPORT

Protecting the corporate information resource

Turning the key

October 29, 1984

COMPUTERWORLD
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SPECIAL REPORT

Legislative action makes data protection hard to ignore

Corporations would have to face question of potential negligence if data was lost

By Stephen W. Leibholz
Special to CW3

Big-time computer criminals are not hackers with bright minds, small goals and infinite time to spend; they are determined thieves with sophisticated equipment, sometimes purchased at the nearest computer store, and superior software to crack passwords and access systems. Industrial espionage, market manipulation and other data-based crimes have made computer crime a problem of national interest.

On Aug. 16, 1984, Secretary of the Treasury Donald Regan signed a directive titled "Electronic Funds and Securities Transfer Policy/Method Authentication," whose long-reaching impact on financial data processing is guaranteed to be profound.

In essence, the U.S Department of the Treasury directed that all institutions, government and commercial, which handle government funds by electronic means, must protect data by approved means — message authentication using national standards. This directive, coming on the heels of a Department of Defense directive requiring the electronic protection of unclassified, sensitive data, is also just in time. Just in time, because the computer criminals are now in their second generation.

These two regulatory actions establish a set of requirements for hardware data protection that will be increasingly difficult to ignore. Corporations and agencies are now responsible for their data, and in the event of data loss, would have to face a question of potential negligence. If executives ignore the standards of good practice established by the federal government and by the American National Standards Institute, they are open to the question of proper care. If the standards were not followed, why?

The impact of these regulations is deep. They have precluded cosmetic fixes. Under these regulations, any government organization, private company or institution is subject to comply if it does the following:

- It electronically handles government funds.
- It electronically handles sensitive data relating to national security, such as MIS files for classified projects, test or procurement data, logistics data and so on.
- It electronically handles competitive or sensitive data such as personnel files, files containing "insider information," trade secrets and data whose disclosure could violate antitrust laws — in other words, if the organization held data in its computer system that might be considered valuable.

Executives must recognize the direction in which the regulatory requirements and data security are moving and realize the greater sophistication of both the protected systems and the invaders. DP managers and executives who are responsible for protecting data can follow these precepts:

- The day of simple software protection is over, and existing and future data systems must be protected.
- The essential elements of data protection are: access guarding, cryptographic data protection on communication lines and removable files, user and terminal authentication and message authentication with permanent audit trails. Different systems require different combinations of these elements.
- It is the security system engineer's responsibility to match the networks, hardware, software and operational procedures of the existing system being protected and to analyze any degradation or operational work load increases.
- End-to-end compatibility and protection of networks used by a system is desirable and feasible; protecting only the links is costly and not very secure.
- In terms of both security and efficiency, protocol-matching or optimal design is superior to transparency. So-called transparency may occasionally be necessary, but is not a one-size-fits-all solution.
- Make few or no changes to your underlying hardware, software and operations; all critical security data, including audit trails and key variables, should be kept out of the mainframe, unless themselves encrypted.
- New security systems should be flexible and meet new network protocols. Ultimately, they should incorporate new cryptographic algorithms.
- Security systems should include a fail-safe design and full self-testing. They should be able to fall-back and recover after errors and have a demonstrated field reliability.
- Information protection is a system and network problem, requiring a system and network solution. It is not a black-box purchase.

Executives must recognize the direction in which the regulatory requirements and data security are moving and realize the greater sophistication of both the protected systems and the invaders.

Managers and professionals with data to protect do not have many options to ensure data security. Software security protection methods quickly become obsolete. Passwords provide only cosmetic protection against thieves, although they provide good accountability for honest users. Every major computer crime that we are aware of since 1972 was accomplished right through and despite a password system. In addition, computer thieves have learned to crack most software systems, computer networks and local-area nets.

Insurance is not a solution. Insurance for unprotected systems costs more on a five-year basis (present-value) than a protective system. And insurance cannot pay for lost sales, lost careers and fascinating newspaper headlines.

Fully automatic hardware facilities are an option. Such a hardware system should be practical, economical, reliable and compatible with existing software, communications and operations. These systems are available.

All protective systems, whether software- or hardware-based, must perform singularly or in combination these five basic functions:

- Communications encryption.
- File encryption.
- Access guarding.
- User and terminal authentication.
- Transaction authentication with permanent audit trails.

Both experience and regulatory direction indicate that these steps should be considered when you are evaluating your security risks:

- Communications data presents the weakest security links. Its protection is vital when handling sensitive information.
- Encrypting software using a mainframe or personal computer central processor is prone to malicious or accidental subversion. The software equivalent of the Mole breaks these systems.
- Protecting hardware communications systems is possible with zero degradation of throughput and changes to mainframe software.
- Encrypting CPU data files is important in fewer cases and then requires as much attention to detail as communications protection. Encrypting smart-terminal data on removable floppy-disk files has merit, but only if used in a hardware system that cannot be subverted by the local processor.

In contrast with communications protection, file protection invariably consumes mainframe and personal computer resources and must be interfaced with existing software.

See GUARD SR/4

Leibholz is president of Willow Grove, Pa.-based Analytics, whose subsidiary, Analytics Communications Systems, is a builder of encryption, authentication and computer security equipment.

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SPECIAL REPORT

How can we stop proliferation of corporate DP crime?

Jay BloomBecker discusses responsibility, degree of severity and ethics involved

Jay BloomBecker is director of the National Center for Computer Crime Data, a Los Angeles-based research center devoted to the study of computer crime.

A recognized expert in the field, BloomBecker's interest in computers and the law goes back some 20 years. As a student at Harvard Law School in 1965, he started the first computer law society there.

In 1978, while working as a prosecutor in the Los Angeles County District Attorney's office, he created the national center as a joint project of that office and the California District Attorney's Association. The center has recently published a book titled The Computer Crime Law Reporter, *a compilation and analysis of state and federal computer crime laws in the U.S.*

The center is also publishing a new monthly newsletter called "Conscience in Computing" devoted to computer-related ethics and crime.

In a recent interview with Computerworld *staff writer David Olmos, BloomBecker discussed computer crime within corporations and other topics close to his heart.*

Q How serious is the problem of corporate computer crime today?

There is a variety of computer crime affecting corporations, ranging from the trivial to the debilitating. On the trivial side, we have employee use of time, storage and other computer functions by a larger number for personal purposes.

We have studied a number of cases at the National Center where employees have gotten out of hand and have used the company computer for their own businesses.

Moving along the spectrum toward more damaging crimes, we have had the extreme case of Saxon Industries, Inc., which went from being a Fortune 500 company to being bankrupt.

Q *Is there any way of determining just how prevalent computer crime is?*

No one is very confident that we've developed the ways to pry the truth out of those people in the position to know about computer crimes to say how much they're aware of [what] is going on.

Also, it is difficult to get a decent estimate of their measure of reliability: of how much what they've detected represents how much has actually taken place. The [National Center for Computer Crime Data] is putting together a statistical report on computer crime that is based on the assumption that we can't get this information unless we have massive cooperation and probably significant funding.

There's no way for us to get even a reliable sample of corporations to know how much they're being hit.

Q Is there any one factor that is responsible for the proliferation of computer crime?

There are a number of factors, and I think they all work together. The clearest thing to me is that technology is a minimal factor, in the sense that virtually every computer crime I've seen could have been prevented by existing technology.

The technology that is available has not been implemented. Why don't we implement it?

I think part of the reason is economics, because of a fairly off-the-cuff and ultimately foolish determination that security is not worth spending more money on.

Part of it is superstition that 'it's not going to happen to me.'

Q Who's responsible for ensuring that security measures are taken? Is it the MIS manager, the chief executive officer or who?

It varies. I think ultimately, of course, the [chief executive officer]. But, depending on the corporation or government agency, the security function may be in any of a number of places.

A recent survey by *Computerworld* [May 28] in the Dayton, Ohio, area indicated an alarming number of corporations have not clearly defined who is responsible for computer security.

It's the kind of thing that can fall through the cracks.

Some major corporations will put their reliance on the [DP] audit side. Others will train their security folks in computing and assign them as the chief security types.

Others will take a DP person who may know very little about accounting or security and say you've got the security function. We're still at an early enough stage in the development of the computer security profession that we don't have much of a solid consensus about how it works best.

Q Is there a most common type of corporate computer crime?

I would say there are two. Numerically, the most common is theft of services. Economically, I think Donn Parker's [computer security expert] observation remains valid that data diddling — simply changing input data or, less frequently, also changing output data and funneling off money — is probably the most significant one.

Anytime you do that there's a chance of a loss ranging anywhere from a couple hundred [dollars] to up to six figures.

It's easy for employees to spot a loophole and take advantage of it, particularly in large systems. That's the one that worries me most from a day-to-day money loss perspective.

Q Does most corporate computer crime take place from within or outside the organization?

Employees are more of a problem as far as I can see. Employees start off with this wonderful on-the-job training for computer crime. It's impossible to train a person to do a job well without giving them the opportunity to learn how to commit a crime.

Most outsiders get access to information through some special relationship [with the organization]; consultants are a real problem because they don't even have the loyalty that employees do. We have had instances, such as the [Wells Fargo & Co.] theft, where the heavy criminal is an outsider, but he gets access to the system because he is able to compromise insiders.

Q How do you evaluate the progress being made by corporations to safeguard against this type of crime?

There are some areas where movement is very evident, such as in legislation. I'm astonished that virtually two-thirds of the states [33] now have computer crime laws. I believe a lot of that is attributable to corporate lobbying.

There's obviously been a lot going on, particularly in the last year; in fact, I think we've had a dozen states since the 414 gang (the Milwaukee-area youths who illegally accessed data bases at Sloan-Kettering Memorial Cancer Center [New York] and the Los Alamos, N.M., National Laboratory] that have legislated computer crime laws. I've spoken with GTE Corp. and [TRW Corp.] and they're quite proud of the efforts they've made. So that's very positive.

On the ultimate level of creating a society that militates against computer crime, I don't think the corporations have yet to see the light of day.

But in dealing with what I consider the basic problem — the moral issues — I don't think corporate America has even begun to recognize the necessity of changing the whole moral relationship toward computers in our society. One big problem underlying computer crime is the fact that lots of people don't like computer users, and they're not real upset about computer crime when the apparent victim is the corporation.

I think that will be true until we have a sense that computer use, even by big users, is in the [man-in-the-street's] interest. In this area, we're still in gold rush times. Everybody's too busy getting rich to worry about getting moral. That's why we've started our Conscience in Computing project.

Q What is the main emphasis behind your Conscience in Computing effort?

To get people talking morals, because if it's not part of the conversation, it's certainly not going to be part of the solutions to the problem. Also, to allow those people to talk to each other. There's no nexus at which people who have this concern can share it with one another.

There's a bulletin board of the Canadian Information Processing Society dealing with ethical issues. That's great, but how many people in the U.S. take advantage of it?

The final thing we want to do is dig out examples of good work to establish ethics, but also if there are very unethical computer practices, we want to talk about them.

Q Do you feel that the state laws go far enough in addressing the problem?

I'm not sure that far enough is the issue so much as deep enough. Up [until] 1983, there were basically two models for all computer crime laws. There was the Massachusetts approach, which basically subdivided

Text, p.24, col.1

SPECIAL **REPORT**

Q&A from page SR/3

property to include intangibles. . . . Virginia and Ohio pretty much followed that approach.

There were also the Ribikoff proposal (legislation proposed in the U.S. Congress by former U.S. Sen. Abraham Ribikoff [D-Conn.]) and the Florida approach (the computer crime law enacted in Florida). Although the two approaches were different, they were both comprehensive legislation dealing with theft involving computers. Virtually every law that was passed up to 1983 fit into one of those categories.

Since 1983, we've seen several fascinating laws. The Connecticut law, for example, abolished governmental immunity as a defense to computer crime. That law also reflects a lot more concern for crimes involving privacy. What I am most frustrated by, however, is the lack of indication that the legislators are looking closely at what we want to protect. Do we want to protect people's sense of privacy? Do we want to protect chips?

Q Do you think that law enforcement officials at the local, state and national levels really understand computer crime?

I increasingly think that those of us who know something about computing overestimate how much we know when it comes to crime.

The cases I've seen haven't, for the most part, been much more difficult to solve than a murder case or a manual embezzlement case. Somehow prosecutors and law enforcement officers have dealt with complex, factual situations that were seemingly above their heads.

I'm sure there are still cops that are scared by the word "computer" and won't go near it, but once they get over that initial fear, they can do just fine.

We don't lose computer crime cases.

The number of cases that have been lost once they got into the prosecutor's hands have been insignificant. What we really need is more money to get more investigators so they can spend more time looking for [computer crime].

GUARD from SR/2

■ Access guarding, the prior forte of password systems, is frequently a dividend of encryption or authentication. Hardware protection systems can access guard at a lower cost than authentication methods.

Recently introduced access guarding systems that use a telephone callback feature have some merit, but are considered by most users to be relatively expensive in regard to the degree of protection offered. Callback schemes do not provide privacy, user authentication or audit trails, and they can be easily defeated. In addition, they consume a large amount of telephone circuit time.

■ If a user authentication scheme depends solely on user-entered data, or if the scheme transmits the authorization code "in the clear" over communications lines, it can be easily broken. User authentication is often a side benefit in systems that perform transaction authentication.

■ Transaction authentication protects vital messages by tagging them with a cryptographic checksum containing data that positively authenticates the user and message. This tag is stored in the system master file and constitutes a permanent, unchangeable audit trail.

The treasury department directive requires this method of authentication. It has been adopted by most of the major financial institutions. Its proper implementation is a critical task for the cryptographically trained system engineer.

■ Security schemes that depend solely on memorized passwords cannot survive a simple computer attack.

■ Schemes in which key variables are maintained on paper are a security risk if the data is not changed daily and if the scheme is not carefully administered.

If your computer system holds data of value, and it is still protected by software alone, it is quite possible that your access protocols are listed on some interesting bulletin boards. The pressure of regulation and of reality has made proper data security a necessity.

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SPECIAL REPORT

Backup options avert risk of forfeiting data resources

By Bud Stoddard
Special to CW‡

Corporations without a disaster recovery plan are playing a high-stakes game of Russian roulette. Disaster recovery plans detail how to protect your information and data resources and what to do in the event of losing your data processing center.

The first step in securing your company from disaster is to make sure that magnetic media backups of corporate information and data are stored in a remote data storage protection facility run by independent professionals.

Step two is to make sure you have a backup strategy in the event that you lose all or part of your DP center. You should know about these backup options.

■ A company-owned backup facility is by far the best security option. The backup site should be idle, or at most, used lightly. Although this backup option is very low risk, it is also very expensive.

■ A hot site is a backup site offered by a commercial vendor on a fee basis to users of a particular family of mainframes. Hot sites are low risk, reasonably costly but effective. They are usually dedicated solely to disaster recovery. In the event of a disaster, the company can occupy the hot site within 24 hours and use it for up to three months.

Hot sites should be located within 20 to 100 miles of the user's principal processing facility to avoid logistical problems when it is time to occupy.

■ Multiple data centers are an option similar to the first, with the exception that the center shoulders roughly half the work load on an ongoing basis. Risk is moderately low and the cost is reasonably attractive.

■ Contracting for emergency coverage with a commercial service bureau is also a viable option. If you consider this backup technique, scrutinize the bureau's contract and its available DP capacity. As a backup, the risk is moderate, cost is moderate, and effectiveness is moderate.

Service bureaus tend to run their DP resources at optimum levels, so make sure that you have contractural guarantees stating that the bureau will have the resources available to support you if the need arises.

■ A commercial shell site is similar to a hot site except it lacks computer equipment. They are immediately ready to occupy, but have no equipment. A shell site provides an absolute minimum of backup protection for a major company. Shell site risks are moderately high, costs are low, and their effectiveness is low to moderate.

If you subcribe to a shell site, get assurances that your DP system hardware suppliers can ship the next available piece of gear to the shell site in the event of a disaster.

■ A reciprocal agreement is an arrangement — made between two companies with similar equipment configurations — to back up each other in case of disaster. This sounds logical and very effective, however, it doesn't work. Most data centers don't have excess processing time. Therefore, the likelihood of one business being able to support a double work load is remote. The risk factor here is high, cost and effectiveness — very low.

■ Your last alternative is to do nothing and play a commercial game of Russian roulette.

Stoddard is president of Datavault Corp. of Needham Heights, Mass.

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SPECIAL **REPORT**

Security managers take heart — help is coming

By Jack Bologna
Special to CW2

Computer security consultants often suffer from one of two psychotic disorders: paranoia or schizophrenia. What makes them that way? Is it genetic or environmental? In my analysis of the phenomenon, I realized that most consultants begin exhibiting the symptoms of these disorders early in their DP or security careers; at about the same time they are asked to solve an enigmatic dilemma. The dilemma is simply this: Make information more accessible to authorized users; and at the same time, make information more inaccessible to unauthorized users.

If you're wondering if you are paranoid, schizophrenic or a paranoid schizophrenic, here are a few guidelines. Total security, as you know, is impossible. You should feel insecure if ordinary, necessary and reasonable precautions are not being taken to protect your computing systems and the information they contain. You are being paranoid if adequate precautions have been taken to secure your DP center, but you still feel doubtful, uncertain and fearful of threats and risks.

My candid opinion is that consultants and managers involved in DP security should feel a little insecure. Computer design technology is ahead of computer security technology. By some estimates, the gap is growing between the two.

Computer designers tend to consider system security implications after the fact. With increased processing speed, more memory, easier access and cheaper prices as ultimate design goals, security is placed on the back burner. Security features in computing systems usually impede access, slow down processing speeds and increase the cost of computers.

The good news

Now here's the good news. There appears to be a heightened awareness of security needs by top management in large organizations. Today, there is a plethora of new jobs and professions relating to computer security. Audit software, DP auditors, data-security administrators, telecommunications security experts, software security designers and security software applications are all available, as well as physical access controls for computer centers and physical security devices and software to control access to computer terminals.

You might be asking yourself: If all of these options are available now in data security, why are managers and consultants still obsessed? The answer to that question lies not so much in their concern for the computer designs and weaknesses, but in their realization of the importance of the information collected now in such vast quantities and stored with such great speed and efficiency.

Safeguarding information is becoming a full-time job for at least one person in many DP shops. Today, for example, many large banks employ one or more full-time data security administrators.

In some respects, computerized accounting and information systems are more vulnerable to unauthorized access than their manual era counterparts were. Information is now more concentrated in a limited area rather than scattered thoughout a building. It takes up far less space and can be accessed by more people from more places; some of which are remote from the site where the information is held. Information that is being processed electronically or by satellite transmission is more accessible to outside intruders than ever before.

Confront accessibility

Accessibility is a problem that must be confronted. There are products on the market that do help. There are access control software packages like the Cambridge Systems Group, Inc.'s ACF2, IBM's RACF, Electronic Data Systems Corp.'s SAC and C.G.A. Computer, Inc.'s Top Secret for MVS operating systems. If these screens fail and intruders access your information, your defense can be to reduce it to garble, that is, make it unintelligible through data scrambling devices. Another option is to store information cryptographically using codes or ciphers.

Access controls can be of the hardware or software variety. With respect to terminal security, they can be equipped with magnetic cards for access or with locks and keys. Other devices include light pens for signature recognition and voice print and palm print recognition devices. Random personal information is another method to check the identity of a terminal operator.

In addition, terminal-site callbacks can be used to verify a user's identity. Terminals can be shut off automatically, if the operator fails to sign off after use. Terminals can be assigned normal hours of operation and locked electronically during non-working hours. Dual controls can be established for terminals through a terminal identification and a user ID. Additional safeguards are used to prevent a terminal operator's ID from appearing on the screen at sign-on time and to bury a terminal's ID in read-only memory so that it will not be turned into an imposter terminal.

Even with these terminal access and operator access safeguards, system security can be compromised. There is still the problem of limiting operator access, once on the system, to only those records, files, programs and operations, to which he is authorized. This is a benefit of access control software.

Access control software packages like those mentioned above and On-Line Software International, Inc.'s Guardian, have an enforcement mechanism that prevents and detects unauthorized access attempts.

So there you have it, some of the options consultants and managers concerned with system security can consider. Is access control software foolproof, fraud-proof or tamper-proof? No, but then again, what is?

Bologna is president of Computer Protection Systems, Inc., a security consulting firm in Plymouth, Mich.

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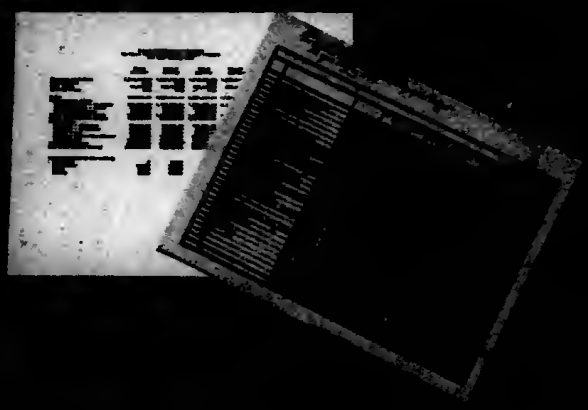

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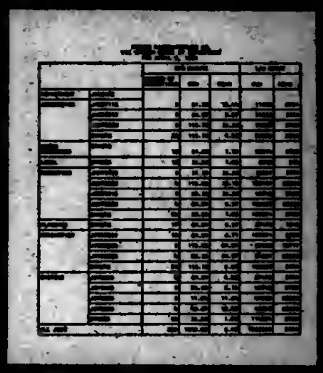

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SPECIAL **REPORT**

Across-the-board training protects data

By Jiri Bendek
Special to CW3

When it comes to data processing security, the most elaborate controls are worthless if system users are improperly trained.

All training programs are not created equal. Choose a program appropriate to your audience and needs. Evaluate the program to be sure that it is professionally designed and presented.

Here are four areas that a training program in computer security should cover:

■ Plant physical security, which encompasses installation protection (from fire, water and so on), access control, surveillance and contingency/recovery planning.

■ Logical security, or the controls that are designed into the computer system. Essential topics in this category are computer and software access controls, data security, encryption and audit trails.

■ Administrative security, or the controls concerning the procedures, documents and magnetic media involved in securing your system. Administrative controls include the security policies and procedures for both computer room and office such as records management, vital records programs, shredding and insurance.

■ The legal and social aspects of security training. This topic should help users, managers and security personnel to understand the legal and social ramifications of security. These issues include privacy legislation, software copyright, product laws, contracts and DP liability insurance.

Information on security and training programs is generally available in the following three formats:

■ Seminars and workshops.

■ Media-based courses such as videotape and texts.

All security training programs are not created equal. Choose a program appropriate to your audience and needs. Evaluate the program to be sure it is professionally designed and presented.

■ Printed materials such as books, periodicals, reports and newsletters.

Training courses are available for users with varying levels of expertise.

Overview training courses are available for general audiences consisting of general managers, technical staff and system users. More technical courses are available for specific audiences, such as data base administrators, system programmers and auditors. Finally, programs tailored to security professionals in specific industries, such as banking or retail, are available.

For a security program to be effective, it is important that any security training be targeted to a wide audience. Top management must understand and support security efforts. Technical staffs must know how to design and implement controls properly.

Most importantly, users must appreciate the importance of security and understand their own roles in maintaining secure systems.

Bendek is a senior writer for Deltak, Inc. of Naperville, Ill., a manufacturer of video- and computer-based training programs.

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SPECIAL REPORT

Computer crime requires preventive action by execs

'White-collar crime of the '80s' poses personal, financial, legal ramifications for officers

By Sanford Sherizen
Special to CW‡

Computer crime is not just another business risk. Recent trends indicate that computer security is becoming a chief executive officer responsibility. In addition, computer crimes can affect a chief executive's personal financial future.

The Foreign Corrupt Practices Act requires management to be responsible for the establishment of internal controls. These controls must provide reasonable assurances that financial transactions are correctly recorded, executed and reviewed. This means that if chief executives do not provide necessary security controls for specific financial transactions, they can be subject to civil and criminal liabilities. The Privacy Act of 1974, a federal statute, also has provisions that require adequate protection of important data.

The lack of a corporate computer security policy can, in fact, serve as evidence that corporate executives were not sufficiently attentive to their legal responsibilities.

Trade secret protections also mandate that proprietary information be sufficiently protected. Some corporations have been chagrined to find out that, even though trade secrets were stolen from them, they had no legal recourse because they had made no attempt to protect such secrets. A trade secret cannot be viewed by the law as a trade secret unless protections are in place.

Even in a case where an unauthorized employee is found using files or manipulating data, corporations without clearly written computer security policies and procedures can be without recourse. Unless employees have been forewarned about certain actions and unless evidence of their computer crimes are carefully handled, actions taken against the employee can backfire. One result can be an employee lawsuit.

What if a corporation decides to protect its public reputation by quietly letting an employee resign after being caught committing an unauthorized computer activity? In some cases, corporations have been so concerned with protecting their public image that they have been willing to trade a letter of recommendation for the employee's resignation and the return of the money. This cover-up can backfire if future employers of that person find out about the false recommendation and sue the original employer. More importantly, failing to report the crime and lack of action against the employee can even invalidate insurance coverage.

Firms can even be held responsible for violations made by their employees. Recently, firms have been sued for not restricting their employees from making copies of certain programs. One software house stated that it will aggressively and publicly act against any firm found allowing this unlicensed copying. The firm made it clear that embarrassment can be more potent than legal action.

The above instances demonstrate that chief executive officers and other top managers have been handed a problem that they never had before: managing computer security. The wise chief executive will understand that it is his responsibility.

Solving the security problem requires immediate action. Here are some suggestions:

- There are new security rules for the computer age. The protection of sensitive information must be a corporate objective.
- Understand the central issues of computer security. The essence of computer security lies with the supports, controls and reviews developed with top executives' assistance and supervision.
- Determine if your corporate computer security is adequate. To do so, learn to ask the right questions of your technical staff. Raise issues of data integrity and access controls.
- Be an advocate of computer security programs by requiring policies and procedures to be distributed under your signature as a personal stamp of approval.
- Assign personnel to security functions and provide them with the necessary resources for an adequate security program. Keep an emphasis upon computer crime prevention.
- Supervise computer security by setting up clear lines for communicating security requirements. Require security impact statements spelling out protection requirements before signing off on major computer purchases or enhancement projects.

Computer crime is the white-collar crime of the 1980s. To a large degree, it is a preventable crime. The physical, procedural and technical protections available today provide a variety of techniques that can be used to protect corporate assets. Thus, the real way to fend off computer criminals is to take responsibility for preventive actions.

Sherizen, Ph.D., is the president of a Natick, Mass.-based computer security consulting firm.

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SPECIAL **REPORT**

Practice makes perfect for users of corporate hot site

All GE companies have access to disaster recovery facility in Schenectady, N.Y.

By Bob Chaput
and Doug Walker
Special to CW

ROCKVILLE, Md. — Different studies estimate that without an operational data center, a business will slow down and eventually stop functioning in fewer than five days. General Electric Co. recognized the critical nature of information resources in the execution of its business transactions and therefore decided to put in place a system for both disaster recovery planning and testing.

In late 1981, the company launched its Information Security and Control (Isac) program. A major element of the program is disaster recovery planning.

In addition to providing guidelines for physical controls, information classification, risk assessment and disaster recovery planning, the Isac program emphasizes periodic testing of disaster recovery plans. GE encourages its operating companies to simulate disaster recovery regularly.

GE operates more than 130 businesses worldwide. Although the firm's operating companies cover diverse business areas, they rely mainly on equipment from the same vendors — Honeywell, Inc., IBM, Hewlett-Packard Co. and Digital Equipment Corp. — for their information processing needs. The similarities in facilities and equipment led the company to seek a common backup facility that minimized total company investment and, at the same time, vitalized the disaster recovery planning and testing process of each business.

After evaluating alternative approaches to providing a facility for disaster backup, GE decided to implement a corporate hot site.

In January 1983, the company, under the direction of its Corporate Information Systems (CIS) operation, selected a site in Schenectady, N.Y., and developed plans to build the General Electric Corporate Disaster Recovery Facility. CIS provided overall program direction, and General Electric Information Services Co. (Geisco), a division based here, implemented the facility. In August 1983, the recovery site played host to its first operating company disaster simulation.

Geisco provides ongoing technical, operational, administrative and managerial support. By locating the disaster recovery facility within one of Geisco's computer centers, GE leveraged technical, operational and telecommunications expertise along with hardware availability and computer-ready facilities.

Operating companies that subscribe to the facility have work areas provided to them in a disaster recovery workroom. Subscribers also have office, terminal and conference space available for their use.

Each GE business is encouraged to reserve the facility to rehearse its disaster recovery plan at least twice a year. About half of all subscribers have conducted disaster recovery rehearsals. The facility is booked for most of the remainder of this year.

GENERAL ELECTRIC'S CORPORATE HOT SITE CONFIGURATIONS

	CPU	Terminals	Storage Devices	Printers	Communications Controllers
[redacted]					
IBM configuration	IBM 3083 (16M-byte memory 11.7G-byte storage)	IBM 3274 display control units IBM 3278 display control units	IBM 3420 magnetic tape units IBM 3380, 3375, 3350 direct-access storage devices	IBM 3203-5 line printer (1,200 line/min)	IBM 3705-J04 communications control unit
[redacted]					

Most of General Electric Co.'s operating companies operate under Honeywell, Inc.'s DPS 6/70, IBM's 4300 or 3080 series, Hewlett-Packard Co.'s HP 3000 or Digital Equipment Corp.'s VAX-11 environments. The firm's Corporate Disaster Recovery Facility provides hardware configurations capable of restoring critical applications — typically 25% to 30% of all jobs — for any operating company running a Honeywell, IBM or HP shop. Each of GE's three disaster recovery facility systems includes a central processor, peripheral devices and data communications equipment. The recovery facility is considering some DEC systems for future acquisition.

Jon Ames, computer security specialist for GE's Aerospace Electronic Systems Department, has taken his operating group through three disaster recovery simulations at the hot site in the last year and plans to hold two tests annually. During each test, his department simulates complete destruction of its data center in Utica, N.Y. "We assume that the data processing center [is] lost and that nothing in this building is available to us," he explained.

During the simulations, eight or nine of Ames' 100 data processing employees relocate to the recovery site. The recovery staff includes software specialists, data communications personnel, system operators and someone who takes charge of magnetic disk and tape files. At the site, this small staff brings up critical applications such as payroll, inventory control and accounting as quickly as possible. In one test, Ames said, the group had its system up and running within 15 minutes.

The total targeted recovery time to resume processing of critical applications is 48 hours. Following arrival at the disaster recovery facility, most user groups can restore critical data files in about eight hours. Much of the other targeted time can be spent reacting to the emergency at the affected site and preparing and traveling to the disaster recovery facility.

Ames said a users manual from the facility has helped his staff prepare well in advance for disaster simulations. GE's "Corporate Disaster Recovery Facility Users Manual," which is distributed to all subscribers, gives a detailed description of facility use. It explains procedures such as how to schedule the facility for testing, how to create system boot decks and even where to stay and dine near the disaster recovery site.

Once the aerospace staff arrives at the facility, the hot site staff provides additional aid to help bring up critical applications.

In the event of an actual disaster or other computer system outage at an operating company's computer center, the disaster recovery facility can be made available within eight hours of notification. The hot site will continue to support the affected operating company until the company's normal operations can resume at its own computer center.

No GE operating group has used the facility during a real disaster.

Chaput is operations manager for General Electric Information Services Co.'s Disaster Recovery Services in Schenectady, N.Y., and Walker is a consultant in information security and control for General Electric Co.'s Corporate Information Systems in Bridgeport, Conn.

GE's disaster recovery plan selected after weighing options

General Electric Co. considered many alternatives for providing a backup facility where operating businesses could rehearse their disaster recovery plans or conduct an actual recovery operation. These included:

- Reciprocal agreements.
- Agreements with mainframe vendors for the replacement of damaged equipment.
- Agreements for shell sites.
- Agreements with third-party disaster recovery service companies for hot sites.
- A company-sponsored hot site.

According to John Cunningham, manager of general management systems development for GE Corporate Information Systems, the company chose to build a corporate hot site because the alternatives had drawbacks.

GE decided against reciprocal agreements because of one overriding factor, Cunningham said. "They don't work."

He explained that a DP shop cannot maintain sufficient CPU resources to handle its own processing and take on someone else's when necessary.

Reciprocal agreements can keep corporate auditors at bay because they show DP has some kind of plan for disaster backup, but cannot fulfill actual backup needs because host sites have insufficient reserve processing capacity, he said. "It's a paper backup."

Cunningham explained that agreements with mainframe vendors have an inherent shortcoming — vendors are in business to sell machines, not back them up.

"There is very little vested interest . . . to effect a service of this kind," he said.

Vendors can expedite orders for new machines when disaster wipes out old ones, he said. But they cannot provide the machines quickly enough, and user sites must wait a number of days to resume their processing. GE required its backup processing to be operational in a number of hours, he added.

Like vendor agreements, shell site arrangements force a DP shop to delay its processing until hardware backup machines arrive to fill the shell.

An additional problem with reciprocal and vendor agreements and shell sites, Cunningham said, is that none of these alternatives provide adequate arrangements for performing disaster recovery rehearsals.

GE ruled out the use of third-party recovery companies, he noted, because the cost of using these companies would be about 50% greater than GE's cost to build its own hot site.

Search leads Goodrich to commercial recovery center

AKRON, Ohio — When a B. F. Goodrich Co. manager began her search for a disaster recovery backup site, she found that books about the selection process were — like the Goodrich competitor's flagship — full of hot air.

"I've never seen so much [fluff] between two covers that said so little," said Carol Dye, Goodrich's manager of MIS security.

Most books cover different backup processing alternatives in detail, but only skim the surface of how a manufacturing company should go about rating different setups according to its needs, Dye said. "There's nothing of substance there to help you."

Under Dye's management, the firm's security group struck out in search of its own process of rating different alternatives.

Goodrich, the nation's 125th largest company and a manufacturer of chemicals and plastics, tires and engineered products, maintains its main data center here. It is equipped with a 32M-byte IBM 3033 dual processor, a 16M-byte IBM 370/168 multiprocessor and a 4M-byte IBM 4381.

The company uses a Systems Network Architecture/Synchronous Data Link Control network with approximately 1,500 CRT terminals and printers attached to it. The network, which supports 50 circuits, also includes remote job entry terminals and 3,790 point-of-sale cluster controllers.

Goodrich's Akron data center supports accounts receivable, accounts payable, salary and wage payroll systems, medical benefits and workers compensation systems, on-line order entry and shipping and billing systems. "These are what we consider the critical systems since they support either a major cash flow mechanism or they're involved with product order entry and shipping," Dye said.

The first step toward protecting the information was clear, according to Dye. "Our digging into the subject convinced us that in order to make a sound decision, we had to know the company's financial vulnerability to a DP outage."

After determining financial risks, (see story SR/14) Dye's group analyzed three backup processing setups:

- Building another computer site on company property.
- Enlarging one of Goodrich's other data centers so that it could back up the Akron center and vice versa.
- Selecting a commercial recovery center.

The group then performed a cost/benefit analysis of the alternatives, using three criteria: setup, maintenance and implementation. Building another site on the company's property failed by all three criteria.

First, building it would be prohibitively expensive, Dye said.

Second, if the facility "was just there, waiting to be used, we'd probably use it for something that was [preemptive]," she said. "But as things are wont to do, that work would become [nonpreemptive] as time passed. It would be difficult to maintain adequate backup capacity there and to cost-justify it."

Third, she said, it would take at least two years to implement this approach. "And in the meantime, we'd have nothing in the way of backup if an outage should occur."

Dye maintained that the same kinds of problems would emerge if the company chose to increase the size of one of its other data centers.

This second alternative especially failed to meet Goodrich's maintenance criterion. "It doesn't make good economic sense to maintain excess capacity strictly for disaster recovery," Dye said. "You would wind up disrupting the processing at that site by throwing off some of the noncritical functions in order to back yourself up."

The commercial recovery center approach got the nod at Goodrich, Dye said, because "the other alternatives eliminated themselves."

Dye's group then evaluated two recovery centers that were large enough for and met the many requirements of the company's backup demands.

Dye said, "To do this, we developed a list of 'must' recovery center capabilities as well as a list of 'wanted' capabilities. We weighed each of these capabilities before we looked at any candidates." To determine its requirements, Goodrich considered both its present needs and those it predicted it would have in the future.

To figure out its hardware requirements, Goodrich used the Best/1 software package from BGS Systems, Inc., which can determine the CPU resources a firm needs to maintain its critical applications. Dye's group estimated Goodrich's needs for peripheral support. And to determine the amount of disk space necessary for disaster backup processing, Dye said, the group manually counted the number of disk spindles used for critical applications.

Goodrich's final "must" list included a number of considerations that related to hardware and on-site shell capability.

One of the criteria was the size of

See RECOVERY SR/14

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Software Corporation of America

Firm determines financial risks from different disasters

Goodrich finds fire most probable trauma, lost sales most critical result

Research into B. F. Goodrich Co.'s financial vulnerability over a period of time to a data center disaster played an important role in the firm's search for a backup site.

Carol Dye, the firm's manager of MIS security, said Goodrich determined its costs from disasters lasting between one week and three months.

"Our thinking was that even with the best plan, you could be out for as long as a week if everything went wrong that could go wrong," Dye said.

"Three months was the time frame that all of our information suggested it would take any company with no contingency plan to establish a new data center if the old one burned to the ground," she said. "We figured it would take this long to locate a site and install not only the equipment configuration and wiring, but also such things as adequate air conditioning and water chillers."

Working with the company's risk management department, Dye and her group established probabilities relative to the different types of disasters — acts of God and man-made — to which the data center would be vulnerable.

BFGoodrich

Dye said determining such probabilities posed a problem because major DP centers are a relatively new category for risk analysis. "Nobody's really been keeping statistics on this long enough. . . . You have to make a guess."

Most probable disaster

The firm's operations research group wrote a program to help the group make informed guesses about the risks. Using insurance statistics, for example, the program determined that a major fire that would put the DP shop out for at least 24 hours had a probability of occurring about once every 20 years. This made fire the most probable disaster the shop would have to face, Dye said.

She said her group also gathered data relating to the financial vulnerability of the business functions supported by critical applications. "We did this," she explained, "by talking to the people who were responsible for those business functions in our different groups."

The different groups wrote scenarios explaining how they would operate in a totally manual environment, she said. "Based on this, they could make estimates on what the costs to the company would be. If they could process only a certain percentage of the transactions they normally would, they would have a good idea of the financial impact on the bottom line."

Cost categories

Three categories of costs were analyzed:

- Effect on sales.
- Extra expense — for equipment, personnel, overtime and so on — to do business without computers.
- Costs due to changing receivables in inventory.

Dye said that because the firm could not perform order entry, inventory and customer service as usual under a manual system, lost sales would ensue, and they would constitute the largest expense during a disaster.

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RECOVERY from SR/13

the shell. "If a disaster did occur, we could use the hot site for only six weeks; after that we'd have to move into the shell. It was vital that it be large enough to house all the equipment we would need to back up not only our critical systems, but also all of our [other] systems," Dye said.

Hardware requirements included an IBM 3800 laser printer, an IBM 3081 CPU capable of processing a minimum of 11 million instructions per second, a sufficient number of IBM 3350 and 3380 disk drives and enough tape drives available for the company's use. During normal processing, Goodrich maintains more than 100 spindles of 3350 disk capacity.

Of the two commercial backup suppliers under consideration, Sungard Recovery Services, a Philadelphia-based firm, better met Goodrich's "must" needs, Dye said.

She said Sungard's backup center in Chicago "more than met our minimum requirements in terms of space." A communications controller in the firm's Chicago center — an IBM 3705 Model 4 — also tipped the scales in favor of the site. "Sungard's telecommunications capabilities were of utmost importance to us. Just about all of our critical applications are on-line systems, and without adequate telecommunications, we simply couldn't use that vendor."

Dye said Sungard also matched up to some of the items on Goodrich's "wanted" list. "We looked for facilities which were laid out well and [were] convenient for our support staff to use. Overall security of the vendor's facilities was another important consideration," she said. "We felt that Sungard had the edge here.

"It also had an excellent technical library in the Chicago center. We believed that our people would get better technical support during testing from Sungard since they've been in the disaster recovery business longer than the other company we looked at. Plus, disaster recovery is their only business."

Goodrich conducted the first test of its recovery system this April. The test's objectives were to generate the operating system, the network control program and Cullinet Software, Inc.'s IDMS and IBM's IMS data base systems. It was completed within six hours, Dye said. The firm plans to run two more tests during the next year.

By the end of this year, the firm expects to have a written contingency plan completed, Dye said. "This will include all of the procedures and assignments that would take place in the event of an actual disaster."

She said the project to date has taken about two years. If a firm concentrated on a similar project for a similar size DP shop, she said, it could finish the work in about one year.

At Goodrich, she said, maintenance and refinement of the recovery plan will be an ongoing task. "As we change our environment, we must continually evaluate the backup site to make certain that it continues to meet our needs in terms of hardware," she said.

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Relative Price Performance Index
**Computerworld, August 20, 1984*

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SPECIAL **REPORT**

Ten-year study culminates in security rating guidelines

By Bruce Kellogg
and George Oostdyk
Special to CW‡

With the publication in August 1983 of the Trusted Computer System Evaluation Criteria, the federal government had a formal means for rating the security of specific data processing systems. The security criteria was the culmination of a ten-year effort.

The Trusted Computer System Evaluation Criteria incorporated the results of the Institute of Electrical and Electronics Engineers and the Association for Computing Machinery computer security conferences. The guidelines include a set of basic requirements and classes for evaluating computer system security controls.

The report states that to be secure, a system must control access to information and that to do so, it must meet the following six fundamental requirements:

- The system must enforce an explicitly defined security policy. This policy determines how access is granted to information.
- All information should have sensitivity or classification data associated with it so that the security policy can be enforced.
- Each individual, or process acting for an individual, must be positively identified. The security system policy stresses access to information only by authorized individuals and their related processes.
- Actions that affect security must be recorded so that responsibility can be determined.
- The combination of hardware and software that enforces the security requirements should be designed so that each can be independently evaluated.
- The mechanisms that enforce the basic security requirements should always be protected against tampering or unauthorized changes. A system cannot be secure if the basic security mechanisms can be subverted.

Since all systems will not meet these six requirements uniformly, the document defined four classes that rate a system's DP security protection. Within these classes there can be subclasses.

- Class A systems are the most secure. They require a formal design that can be verified and a formal model of the security policy. A combination of hardware and software mechanisms automatically ensures that security policies are enforced at all times.
- Class B systems implement a formal security policy and maintain sensitivity labels on data. Class B systems control all access to information by users and their processes and maintain comprehensive audit trails.
- Class C systems let users access information on a need-to-know basis by individual or by group. Individuals or groups are uniquely indentified to the system.
- Class D systems provide the lowest amount of protection. Class D is reserved for systems that fail to meet requirements of a higher class.

In addition, the criteria presented guidelines for system evaluation. These guidelines included recommendations on the levels of experience for the personnel doing the testing, formal training requirements, knowledge of methodologies and system details. It also provided guidance on the types of security tests to be run and the length of time to be spent testing.

Kellogg and Oostdyk are senior computer scientists with Science Applications International Corp. of La Jolla, Calif.

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SPECIAL **REPORT**

Assessing DP site security gaining priority status

Location, site characteristics, fire protection, backup enhance safety of operations

By Grant Moyer
Special to CW‡

Physical security for computer operations is gaining importance because of the increased use of on-line interactive business applications and the increased reliance on computers in general.

To assess your data processing site security, consider these points:

- Its location.
- Its site characteristics.
- Its fire protection systems.
- Its support systems.

Where a data center is placed within a corporation's physical plant, has much to do with how secure it is.

In recent years, with the improvements in telecommunications, there has been a trend toward building dedicated or stand-alone data centers off the beaten path. Building a separate center, although expensive, gives you the opportunity to design a building ideally suited to your special data processing needs.

A separate facility presents at least two advantages over shared space:

- There is a reduced risk from water damage or from fire caused by occupants in adjoining space.
- It is easier to control access to the center because traffic is limited to DP personnel or to others with specific reasons for entering the building or its general vicinity.

Visibility is a factor in securing your DP room. Signs and directories should not advertise a data center's location. A site located inside a larger complex should be outside of heavy traffic areas, if practical and screened from the general public.

Depending on the locale, windstorm, earthquake exposure and flooding should be considered in both building design and contingency planning. Also, consider security threats posed by other environmental complications such as industrial vapors, dust, microwave/radar radiation and excessive vibration.

Locations that are susceptible to flooding from either natural or man-made sources deserve special attention. Basement areas are not suitable for computer operation or any of its auxiliary equipment because of drainage problems and the reliance on pumps or other mechanical methods of drainage.

More DP installation insurance claims are filed because of water damage than from any other source. Backed up sewer lines, broken water lines, sprinkler discharges, roof leaks or almost any other sources of water above the computer room are potentially dangerous.

Fire protection

Computer room fire protection begins with properly rated fire extinguishers spaced throughout the operations area and includes employees who know how to use them. Automatic fire detection and suppression systems offer additional protection if manual efforts fail.

DP environments require a highly sensitive fire detection system. Because electrical fires in equipment tend to be too localized to appreciably raise room air temperatures (even though the fire itself burns quite intensely), detectors should also be sensitive to smoke or other products of combustion.

Sensitive devices such as these generally register an alarm well before ceiling temperatures reach 130 degrees Fahrenheit. Water sprinkler systems generally require temperatures in excess of 165 degrees Fahrenheit to sound an alarm.

Halon 1301 gas is the suppression agent generally acknowledged as the best for the computer room environment. Halon has its detractors, because it is not reliable under all circumstances, and it is extremely expensive.

Undoubtedly, the best fire protection you can buy is a Halon system to protect equipment, augmented by preaction-type dry pipe sprinklers to protect the building. Water sprinklers should be used in stock, decollating, bursting and distribution rooms because Halon cannot dependably extinguish the deep-seated or smoldering fire typical of paper.

Fire detection systems should be integrated with support systems to provide for electrical and mechanical shutdown within specific protected areas before Halon is discharged. Similarly, interlocks in the DP center control panel should charge the dry pipe sprinkler system with water when activated by the fire detection system.

The control panel should also generate local and remote alarms at the main security office and central station or fire department.

If a fire cannot be put out manually, the room is evacuated, and the Halon is released. The center should have emergency mechanical vents to exhaust smoke and corrosive fumes after the fire is extinguished.

To prevent security breaches, individuals should have access only to those resources necessary to do their jobs. The layout of the DP center can make this easier by clearly establishing territories with zones of increasing security. People should be authorized to pass each entry point.

This security control center incorporates both access control and intrusion detection features.

Evaluate goals and trade-offs

Evaluate your goals and trade-offs when determining the security of your facility. Some security tips are:

- Monitor activities so that one person doing his job acts as a check on others.
- Record entrance and egress point activities so individuals are held responsible for their actions.
- Control access to sensitive material and critical equipment.

In the final analysis, your security needs can be achieved by balancing the need for protection against costs and the requirements for efficient work flow.

Another security option is to combine your building's floor plans and security devices into an integrated system concept. For normal traffic, a limit of two entrances to the building is preferred, one as an employee/guest entrance and one as a loading dock for material. If your DP center is in a larger plant facility, limit entrances.

If you establish layers of security, such as fences, doors and locks or card keys, the better your access control will be. Control barriers should be enforced by automatic monitoring devices for intrusion detection at normally closed windows and doors and key control points in the building. Unfortunately, this method of access control can, by the same token, significantly restrict work flow; careful planning is essential.

Electromechanical support systems for computer room environments include special power and cooling equipment, distribution systems and related control and monitoring devices. These systems, as well as the complex fire suppression and detection systems, are difficult to audit easily. One method is to consider their past performances.

Unlike the other areas of physical security, failures in the power or cooling systems result in costly unscheduled downtime. Remedies for the situation are evaluated on the basis of cost/benefit analysis. A scheduled program of preventive maintenance, extensive monitoring and alarm systems is your best bet to ensure that these systems are as reliable as possible. A DP design that provides spare capacity through planning and redundant and standby systems for fall-back support of critical loads in the event of a system or a component failure also ensure a high degree of reliability.

Moyer is a staff consultant for the Austin Co. of Cleveland, a firm specializing in the construction of buildings with high-technology components.

Insurance underwriter [illegible] hazard analysis criteria

[illegible]

SPECIAL **REPORT**

Forming a contingency plan starts with paper and pen

By Dan Rosenberg
Special to CW‡

Disaster recovery planning may be a thorn in your side, but with a strong outline or coverage document, creating a plan is not difficult. Think of contingency plans as a form of insurance. Before you purchase any form of insurance, you must decide upon the coverage.

The first step to creating a contingency plan is writing a coverage document. It should include these six major areas:

■ Title and introduction. Select a title and write an introduction that states explicitly that the finalized document will serve as the foundation of a detailed contingency plan.

■ Critical classification. Classify corporate applications into three major categories: those where automated services are required to keep the company operating, those that would cause major disruption and require substantial additional manpower if automated services were not restored in a reasonable amount of time and those that can function without automated support for extended periods of time without causing major disruption. Categories can be added or further defined.

■ Time impact analysis. This identifies each activity that must be performed for individual applications during a disruption. Any key timing considerations should be detailed under this heading.

■ Recovery approaches. This addresses standard recovery techniques and their relevance to your situation. The three basic recovery approaches to be addressed are mutual aid agreements, contingency centers and duplicate facilities.

Mutual aid agreements, or reciprocal agreements among a number of companies, can be feasible depending on your operating system, application software and telecommunications facilities. Even if these items can be addressed, logistical issues have to be considered. You must also consider if you would be willing and able to allow other organizations to use your data processing facility.

You can own and maintain your own contingency centers or you can contract with a third-party organization on a fee basis. You may already have what is commonly referred to as a shell facility at some other location within your company. A shell is a computer room ready for computer installation. Fully equipped computer facilities available on demand, often referred to as hot sites, are provided primarily by outside organizations. The traditional service bureau company also falls into the contingency center category.

A third approach is to have duplicate facilities separating your data processing hardware into two or more geographic locations. Separate computer systems could process independently or they could be networked. Should there be a problem at one site, the critical applications could be processed at the other.

■ Recommended recovery strategy. This is the key section of your document. The subsequent phases of your project will be directed by the strategy you outline here.

■ Applications systems. This contains the supporting detail for the report. For each application, you should include a description or brief summary of the general purposes of the application and users who supply input or use output of the application; characteristics such as batch, on-line entry or real-time updating; and interfaces with other applications and the frequency. It should also include the resources that are necessary for manual processing; critical factors including legal considerations; and descriptions of each type of disruption and the viable alternative for dealing with it.

Once a coverage report is written and agreed upon by all the parties involved, a contingency plan can be written. Decide on the basic format and content of your detailed contingency plan. There is no standard for this and it varies in each situation.

The plan should be testable and easily maintained and updated. You must establish testing conditions, expected results, evaluation criteria and follow-up action to be taken based on the results.

It is vital that the coverage report is periodically revised so that the plan can be updated and retested.

Disaster recovery planning is ongoing. Users and management, as well as the DP staff, must be involved. Coverage definition is an iterative process involving users, management and DP. The cost of developing the initial contingency plan is only a portion of the total cost involved to evaluate coverage periodically and update and test it.

The data center contingency plan should be a part of an overall data recovery plan. Plans should be developed above and beyond responding to an audit area. If you are currently constructing a contingency plan and are having problems, a growing number of firms offer contingency planning consulting services.

Above all, remember that successful data center recovery plans must be built upon the coverage required.

Rosenberg is a senior manager with Price Waterhouse & Co. of Atlanta.

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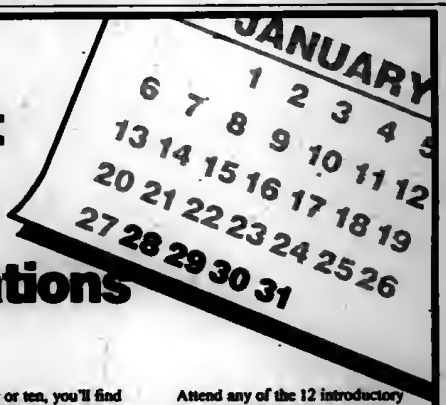

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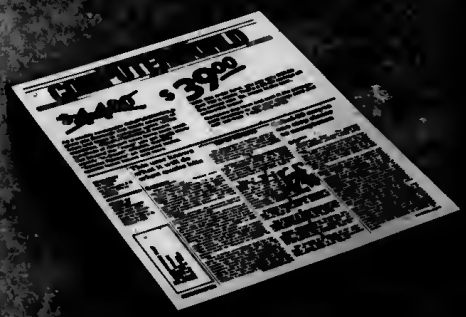

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SPECIAL **REPORT**

Safeguard micro-mainframe link with software options

By Robert L. Campell
and Reed Phillips Jr.
Special to CW‡

Recently, a Fortune 500 company learned the importance of proper access controls and identification codes when its micro-to-mainframe electronic mail system was accessed by a disgruntled employee.

Access control and proper identification of users takes on increased importance as the communications barriers between microcomputers and mainframes disappear. As these barriers are broken, more and more users will want to access mainframe files and data bases. These users will want to download, upload, modify and delete data on mainframe files.

Although the security technology to safeguard mainframe-resident files and data bases from indiscriminate access by microcomputer users is lagging, security options are available.

Currently, security software is a viable option to protect corporate data. It is practical and readily available.

Several mainframe hardware and software vendors market security software for on-line micro-to-mainframe environments. The software commonly includes passwords, computer logs or journals, terminal identification, time-out facilities that automatically disconnect terminals that have not communicated with the mainframe within a prescribed period of time and access disconnects that disconnect a micro after a specified number of unauthorized attempts to gain mainframe access.

Within the next six months, packages that combine hardware and software security measures, including systems that feature individually programmed hand-held decoders that interact with software, systems that require users to insert a programmed key into a specialized piece of equipment and systems that electronically modify or fingerprint floppy disks, will be available.

File software packages

In addition to these, a wide range of file-transfer and automatic reformatting file software packages are being marketed. File-transfer packages allow files to be downloaded or uploaded to a mainframe. Most of these packages allow file transfers that ban users from sensitive files or restrict user access to the data needed for a specific function.

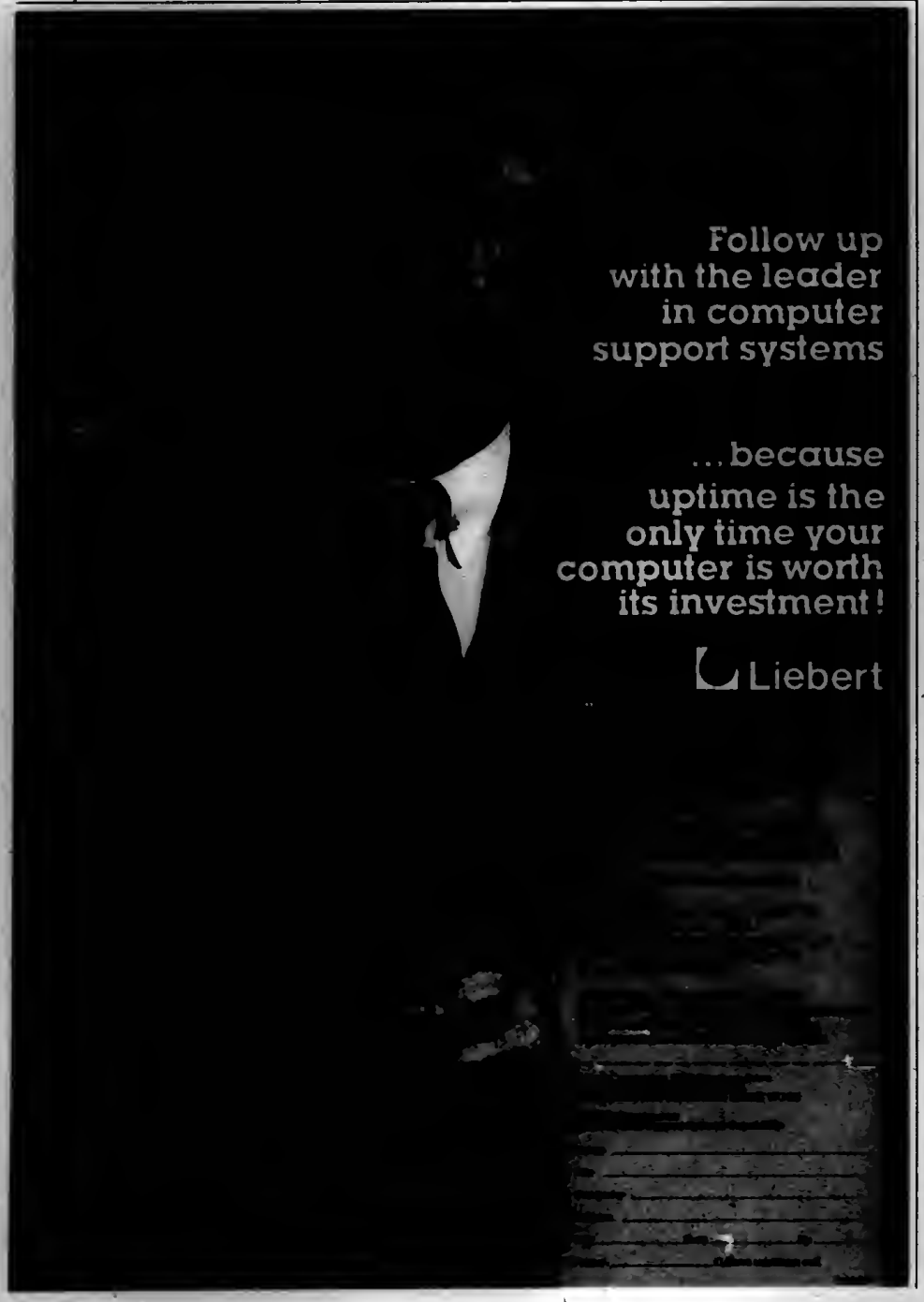
The various automatic reformatting file packages on the market also have access controls to the mainframes. The individual security provisions for these packages vary so, when purchasing one, consider the degree of data protection you need.

Another commonly used security option is encryption. When a file is encrypted, it is sealed. Data access is excluded to all except those having the proper key that will decrypt the data.

While the technology behind encryption is not difficult to understand, applying the technology to data security can be difficult. Practical solutions to the problems of key security, distribution and management have not yet been answered. Consequently, encryption techniques are of limited, or of highly specialized, use for the micro-to-mainframe connection.

If microcomputers have been mainstreamed into your computing arsenal, security measures are a must. In essence, along with the benefits of micro-mainframe compatibility come risks. Data transmitted through micro-mainframe connections is vulnerable to destruction, improper modification and unauthorized disclosure, whether intentional or not.

Campbell is president and Phillips is vice-president of marketing at Advanced Information Management, Inc., of Woodbridge, Va., a private international consulting firm specializing in computer and telecommunications security.



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SPECIAL **REPORT**

Employees' security-related education a priority

By Carolyn Crowson
Special to CW‡

Educating employees to the importance of data security should be a management priority. A modern data security program includes an education and communications plan complete with a budget for training materials, graphics and professional writing.

An education and communications program does the following:

- Gives managers the data security knowledge they need to make cost-effective decisions while understanding the security threats and exposures in their business operation.
- Provides managers with the knowledge to know when to call on data security expertise.
- Teaches employees data security policies and procedures.
- Results in added employee compliance to policies and standards through knowledge and understanding of their content and intent.

There are several ways to spread the word on data security. Methods vary from organization to organization. Review your company and look for ways to communicate with staff and managers.

One way is to publish articles on data security in company newsletters. These articles keep employees aware of the data security function within their organization.

Another medium that can be available is a management letter that is distributed to varying levels of management throughout the company.

Publish articles in trade journals and industry newspapers to bring attention to your program and add credibility to your message. Include information on the state of security within the industry and emphasize the problem-solving nature of data security departments.

*For product information and a full-color SuperSam poster, write to SuperSam, c/o LeeMAH Datacom Security Systems.

Create a password awareness program to help protect the password systems. The quality of your corporate passwords is the most important control you have to protect data banks from unauthorized access. Write a brochure or handout on the proper treatment of passwords and the information they protect. These simple rules can also be printed on stickers and placed at each computer terminal or on the computer equipment itself.

Fortune cookie gimmick

One security awareness gimmick used for data security training sessions and management meetings is fortune cookies with security messages printed inside.

Simple short rules should be written out and discussed with each employee. They include:

- Do not disclose your passwords.
- Choose a password no one can guess.
- Change your password every 30 days.
- Customer information is confidential.
- You are accountable for work done under your password.
- Log off before leaving your terminal.

Managers who authorize their staff or other people to use data should notify the data security department of terminations, transfers, vacations and changes that affect the access privileges of their employee.

Design a data security training program to give managers, key systems people and auditors the whole data security picture. This will allow them to make better control-related decisions on their own, but realize when to call on data security experts for assistance.

Evaluate the existing training programs within your organization. Write a data security module to be included in appropriate programs. Include management training, technical training, project management, employee orientation and so on. Bank robbery training, which is required by the Bank Protection act, is an excellent forum for data security awareness. This training program has been directly related to detecting and preventing wire-transfer fraud attempts.

Auditors, systems analysts, product developers, project managers and user liasons need in-depth data security training. These training programs work best if given in half-day segments for between 15 to 25 people. They should cover the threats and exposures dealt with in data security, but emphasize the solutions that are available.

Create an employee awareness program. This can be done in person during orientation training by developing or buying a video tape on data security or by distributing brochures.

Take advantage of training programs within your organization to provide assistance staffing and creating seminars. Develop training ma-

See PLAN page SR/26

Crowley is vice-president of the corporate data security department of the Seattle First National Bank, Seattle.

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Firm utilizes software escrow for access control

TORRANCE, Calif. — A software publisher here encountered a strict demand from one of its customers for security should the vendor abandon its product.

According to Kenneth Bodger, vice-president of systems for software publisher Science Dynamics Corp., the firm's customer "felt threatened by the fact that we could decide the business wasn't lucrative enough and that we would start making retreaded tires instead."

Bodger said the customer demanded security before it would purchase an integrated operating system environment from Science Dynamics, and the vendor considered its options. "Certainly we weren't going to give them the source code or sell them the source code. But, we did tell them that in the case that we did go into bankruptcy or in the case that we won't support the product any longer, they would be able to have a copy."

Science Dynamics and its customer agreed on an arrangement called software escrow, in which proprietary software materials such as source codes and updates are deposited with an independent third party.

Such an arrangement prevents unauthorized access or alteration and guarantees access by interested parties in case of product discontinuance, bankruptcy, theft and copyright and trade secret infringement.

The arrangement made sense for Science Dynamics' customer, a small systems house in Santa Monica, Calif., that develops banking applications software, Bodger said. "Because our product is so expensive [$30,000 minimum] and so critical to their future development, they demand some sort of security."

Science Dynamics operated as a vertical market systems house for 15 years before it became involved in horizontal software publishing and software escrow, Bodger said. The product that led the company to the horizontal marketplace, Magix, was developed in 1981 by software authors under contract to the firm. The product combines a relational data base with other tools.

When the systems house demanded escrow in March, Bodger turned to Data Securities International, Inc. to provide the arrangement. Under Data Security's Proprietary Deposit service, Science Dynamic's proprietary software was placed in a deposit account that provides physical protection in an environmentally controlled repository.

When the escrow account was opened, Science Dynamics specified, through control documents supplied by the escrow firm, the contents it wanted deposited in the account. Data Securities International then took possession of the contents — 12 diskettes containing Magix source code and some hard copy — and verified and stored them.

Science Dynamics and its customer signed a legal contract that set out the conditions for access, for reporting changes in the contents, for handling disputes and for further verification of the contents.

Bodger said that he could have made similar arrangements on his own, but that he preferred the third-party route.

"I would have had to do all the legwork," he said. "I would have had to hire an attorney, set up an escrow arrangement that everyone could sign, pass it through the software author and get it approved by the buyer. And I would have had to go through that hassle each time [any new agreements were made]."

Science Dynamics offers the escrow arrangement to all Magix users who want access to the source code.

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SPECIAL **REPORT**

Water, water everywhere — but shipyard stays afloat

NEWPORT NEWS, Va. — When an early morning disaster struck one of its computer rooms, a shipyard here launched its disaster recovery program full speed ahead.

At 4:15 a.m. on a Thursday last June, Dennis Dickinson, manager of the computer user services department at Newport News Shipbuilding, answered a phone call from his third-shift supervisor. The supervisor said a steam pipe running through a room housing two computer output microfiche (COM) processors had burst. Fifteen minutes later, Dickinson arrived at the scene.

"Steam was rolling out the front door of the building when I arrived," he said. "When I got to the COM room, you couldn't see across it for the steam that was in there. Everything was sopping wet."

A series of actions

The supervisor's call to Dickinson was one of the first actions in a series of moves prescribed by the firm's recovery plan. Before calling Dickinson, the supervisor phoned security guards, who, according to the plan, contacted the fire department and other emergency workers.

By the time Dickinson arrived at the office, all of these moves had been initiated, he said. Nobody was injured.

Ledford Craft, the firm's operations supervisor, arrived at the office at about 7 a.m. The area in which the pipe had burst was sealed off to all but emergency personnel. Environmental inspectors were at work determining whether the area was safe.

As one of his roles in the recovery process, Craft started calling the vendors of the damaged equipment in the computer room. He said that two NCR Corp. Model 118 COM processors, which were crucial to the firm's operations, suffered the worst damage.

Responding to Craft's call, an NCR technician arrived by 9 a.m. The technician opened up the COM units and tested them. The technician stayed until 10 p.m. attempting to bring the units back up — to no avail. The heat and water had done too much damage to the machines, according to Craft.

Craft also initiated another step in the recovery plan. He contacted the firm's backup processing site in Richmond, Va., a firm that has seven COM processors. By Thursday evening, he said, backup arrangements were completed.

Microfiche backup essential

Having a backup processing facility for the microfiche was an essential part of the firm's disaster recovery plan, Craft said. The shipyard runs 50 different applications on its two COM systems, producing 8,000 original microfiche and 160,000 duplicate microfiche monthly.

The biggest microfiche job was the quarterly production of the yard's materials catalog, which listed some 230,000 items the firm uses to build ships. Daily microfiche production involved such reports as inventory management, tools and equipment, material accountability and production scheduling and control systems.

One customer that received the microfiche was the U.S. Navy, for which the shipyard is a contractor. Craft said the firm's customers needed to have information from the microfiche. Even after a disaster, he said, "It's very important to us that we do have this microfiche capability."

Until a replacement for the machines arrived, Craft said, the firm had to transport its data tapes every day to Richmond, which was 80 miles away. "Then we brought back the previous day's tapes and the completed fiche," he said. "It was slower, but we got the work done."

To reestablish in-house COM processing, Craft said, the firm decided to scrap one of the NCR machines and fix the other. One had stood directly under the rupture in the pipe, and steam and water had poured into it, damaging it beyond repair. The other, which had been further away from the rupture in the pipe, suffered less damage.

Both machines were transported to an NCR facility depot in nearby Virginia Beach, Va. But, Craft said, "The rebuilt system wouldn't be ready for another week or so, and we were without any COM capability."

He turned to NCR for help. "On the day the pipe broke, the NCR district manager in Baltimore said he would do everything he could to get a replacement as quickly as possible," Craft said. "We decided to take him up on it."

A promise kept

Craft placed an order for an NCR 5330, a newer model of the COM system, at about 11 a.m. on the Wednesday following the pipe break. By 6 p.m. the next day, the new system was delivered to the shipyard's loading dock, accompanied by a field engineer to install it.

"It is obvious that they flew the new system from California to Virginia to get it to us so quickly," Craft said. "They knew we needed it."

By the following Monday, the installation was complete, and the new system was running production work. By that time, peripheral mechanical equipment in the COM room — sorters, reproducers, coders, document handling equipment and the like — was also repaired.

Craft said speedy repairs and replacement are integral to the firm's disaster recovery plan. He gave partial credit for the quick vendor response to his firm's ongoing relations with its vendors. "If you have good relations with them, they might do a little extra for you. . . . It certainly can't hurt you."

Craft specifically praised NCR for its quick response. "I personally think they went all out," he said. "I'm assuming they would do that for any customer."

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SPECIAL **REPORT**

Designer, contractor key to DP center construction

By Joe N. McFutter
Special to CW3

Your new data processing center does not have to be built like Fort Knox or managed like the Pentagon, but security should be a fundamental concern in planning a DP center. Choosing a designer/contractor who understands the importance of DP security is vital.

A corporation's investment in its data processing facility is a major capital outlay. For the small- to medium-size business, the cost is monumental — perhaps the largest one-shot capitalization it will ever make. A state-of-the-art facility can range from $100/ to $250/sq ft — exclusive of computer hardware.

Generally, there are two ways a corporation can transform a data processing facility from the management mind's eye to a real on-line operation: using the traditional design-bid-build approach or else the turnkey, or design-build, approach. Although each has its merits, the design-build approach offers distinct advantages when constructing computer facilities.

The design-build approach streamlines the design and construction process by assigning responsibility to a sole contractor who is accountable to the project from design to completion.

When a corporate owner awards, on a negotiated basis, the responsibility for both designing and constructing the facility to a single contractor, the need for separate architects, electrical and mechanical engineers and numerous other computer-related specialists is eliminated.

The design-bid-build approach, when looked at closely, follows this procedure: Management appoints a project manager and/or committee, the manager accepts proposals from various outside parties to participate in the design process, and bit plans and specifications are drawn up. Next, several contractors and vendors are invited to bid on the work, the contracts are let, and work proceeds until completed.

The design-bid-build approach usually produces an acceptable product because of the project manager's relentless determination that he get good results and because the key professionals involved — consultants, architects and engineers — usually have a high sense of integrity. Contractors also have interests in producing quality construction.

However, this approach does not always provide the optimum, cost-effective design and construction of a functional and secure facility.

Design-build advantages

The design-build approach has several advantages:

- The consultant/contractor is one and the same: The firm that designs the facility also builds it.
- Communications are improved because there are only two parties working together — the owner and contractor.
- Since the builder is involved at the outset of the project, he can interpret management criteria into cost-effective design and construction materials and methods.
- Coordination is maximized. This is especially critical in fast-track projects where schedule dictates that construction must begin even before the design is completely finished.
- Design-build contractors who specialize solely in computer facilities construction have a compelling vested interest in performing the job well.
- Design-build involves fewer layers of contracts than design-bid-build, resulting in reduced cost markups. This yields a lower bottom-line price to the owner.

Admittedly, the design-build approach is idealized. There are variations and graduations of the concept. Obviously, the design-build consultant/contractor should specialize in the total design and construction of computer facilities.

The contract between the owner and the design-build firm should be arranged in phases, so the owner can opt out at certain milestones if he is not satisfied.

Here are three obvious phases, or breaking points, in a contract that protect both the owner and the contractor:

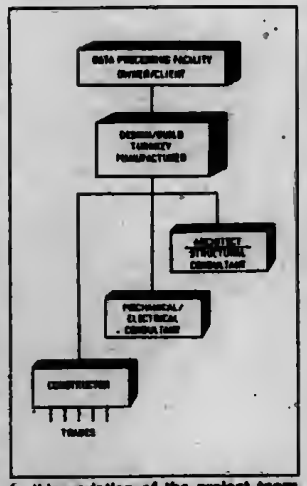
- Phase One. Retain the contractor to provide comprehensive information gathering, study and analysis of the owner's needs. This single-point contractor should address these issues: facility siting, data processing, telecommunications, support operations, space planning, security, power distribution, air conditioning, fire protection and life safety.

If you're the owner, expect an in-depth report from the contractor on the above concerns that includes your immediate and long-term projected operations. The report should include schematic drawings, where applicable, and a rough cost model for budgeting purposes. It should also provide alternatives, options and recommendations.

- Phase Two. Once both parties agree upon the specifics of the project, the design work begins. This phase contracts for services usually found in standard architectural and engineering design contracts. The design work should proceed in three stages: schematic, design development and working drawings/specifications. This third stage includes the details for construction of the facility. It is upon this touchstone that the owner and contractor must agree upon a final construction contract price.

From the owner's standpoint, there is no bidding involved. The contractor is responsible for keeping the price within budget and seeing that proposed work meets the requirements defined in Phase One. To protect the owner, a guaranteed maximum price can be affixed. The contractor would then have the work done on a cost-plus, not to exceed the guaranteed maximum price, basis. Savings would be split between the contractor and owner.

- Phase Three. The owner contracts the design-build firm to begin construction. Work proceeds. The owner has only to interact with the contractor, who shoulders responsibility and liability for the construction of the DP center.



In this variation of the project team structure, the turnkey contractor holds responsibility for all specialty consulting, most design work and all project management. Subcontractors serve as consultants and perform most of the physical work.

McFutter is vice-president of engineering for Total Assets Protection, Inc. of Arlington, Texas, an international design and building firm.

PLAN from page SR/22

terials and classes that can be given by members within the corporation as well as the data security officers. Check with training departments within your company before deciding on the format or medium for your training program.

Training should be cost-effective in terms of employee time. The people who have the most decision-making impact on control objectives are generally the busiest people. They are managers and systems people. Consider their time constraints when designing a training program for them.

Target an audience for each education and communications program. Data security has evolved its own language and jargon, including information asset, encryption, key management, appropriate compensating control, risk assessment and threat analysis.

Before giving a presentation, consider your audience and their level of sophistication concerning control topics and DP.

Test your scripts and training programs. Printing and reproducing quality training materials and written materials is expensive, so make sure your presentation is effective before going into full production. Follow up on suggestions and evaluations from members of your audience. Pilot test each program and revise materials if needed.

After you have produced your training and education program, systematically cover the entire organization with the material. Determine who needs what training, schedule and present the classes. Plan periodic reviews and follow-up for key employees.

It is not enough to have security policies and procedures in place for people to follow. Employees must understand the policies and procedures for policies and procedures to be effective.

Data security is not just the responsibility of the data security officer and the DP audit department. Data security is everyone's job.

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SPECIAL REPORT

Subscription service best offense for defense contractor

TORRANCE, Calif. — A matter-of-fact sensibility helped a defense contractor here focus its recovery planning away from major disasters and toward more mundane and more likely problems.

"Quite frankly," said Greg Owen, DP manager at Magnavox Advanced Products & Systems Co., "in the first few days, whether I'm running or not doesn't make any difference in the event of a major company disaster. No one in the company would be operational, and DP support would not be an immediate necessity."

So, the shop worried, instead, about a more pressing risk to DP, a localized disaster that might bring down one critical machine.

Based on concern about the loss of individual components, the firm's disaster recovery plan includes:

- Using some redundant equipment.
- Maintaining off-site backup copies of all data and program masters.
- Publishing a personnel and equipment requirements list.
- Ranking applications according to their importance.
- Locating outside computer time for use in case of a disaster.

The DP shop at Magnavox, a subsidiary of Magnavox Government and Industrial Electronics Co. that manufactures navigational equipment, places emphasis on engineering and cost control systems. The firm's payroll and accounts receivable processing takes place at a Magnavox office in Fort Wayne, Ind., so a disaster here would have no immediate impact on the business' cash flow, according to Jim Casson, the firm's data center manager.

Redundant controllers and segregated disk packs in the DP shop here protect the firm from a total system failure caused by the breakdown of any one component. But if disaster brings down the firm's mainframe, a 16M-byte IBM 3033 with 20G bytes of disk capacity, Magnavox must turn to a backup processing site within a matter of days.

Magnavox subscribes to a service designed to help it locate a backup processing site if its CPU breaks down. The Backup Resource Pool from DPCS, Inc. provides its subscribers with a monthly report that lists DP sites that can provide disabled shops with compatible hardware and software.

The reports list the names and phone numbers of site managers who arrange for the use of their firms' computer resources by outside firms. The service also provides some timely information that Casson said he finds especially important: "The reports show us exactly how many hours are available on what days of the week and what hours of each day."

The service's ability to provide up-to-date information on availability was one of the main reasons why Magnavox chose it over other alternatives.

According to Owen, the Backup Resource Pool service provides more reliable backup than a reciprocal agreement does. "We can have a realistic relationship with a company without getting into the false premise of 'I'll back you up if you'll back me up,' when in truth that company has limited availability," he said.

Casson explained that when two firms make reciprocal agreements, they must rely on each other's ability to make good on a promise. If the backup site has a big job running when its partner shop breaks down, he said, it may not be able to fulfill its part of the agreement. In that case, the disabled shop has nowhere to turn.

Subscribers to the resource pool meet with each other regularly to explain the resources they might have available at any given time and to discuss possible recovery plans, but make no promises, Casson said. Magnavox usually keeps in contact with two or three possible backup sites so it has a choice of where to turn if disaster strikes.

Casson said the subscription service is also more reliable than a local commercial hot site. If a major disaster like an earthquake hit the area around Torrance, all the firms who purchased use of a local hot site would want to use the facility's resources.

If just one high-priority user needed all the available resources, he said, all the hot site's other customers would be stuck without computing power.

Although use of the resource pool leaves a firm with no pat arrangements for backup processing, Casson said, it fits into overall disaster planning just as a more definite arrangement does. Before disaster strikes, a firm that relies on backup from other companies in the pool must have in place detailed plans that show what kind and what amount of backup processing it needs. "The difference," he said, "is where you're going to recover."

He said Magnavox's corporate security auditor approved the pool as a satisfactory backup arrangement, even though it is open-ended. Generally, auditors are concerned that a DP shop has some kind of plan.

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Micro networks worthy of mainframe-type protection

By Stevanne Ruth Lehrman
Special to CW‡

Although they are newsworthy, malicious hackers romping through data bases are not a microcomputer network's biggest security problem. Despite claims about the prevalence of hacking and wiretapping, the most serious threat to a local network is from misuse by insiders.

A security access system similiar to a mainframe's is needed for microcomputer networking.

The design of current microcomputer networks is to blame for much of the problem of data security. Most micro networks cannot differentiate between users or restrict file access. Network server micros frequently have access to all data files and all disk drives, with no controls to guard this access. The very technology that makes the network possible can just as easily be its downfall.

The design of current microcomputer networks is to blame for much of the problem of data security. . . . The very technology that makes the network possible can just as easily be its downfall.

Mainframes, on the other hand, provide operating system software that controls the sharing of data, programs and computer resources. The operating system establishes usage tables defining authorized users along with their access rights. Access can be read-only, write, modify or execute. Each time a user requests data, the request is first checked against the authorization table before either the data is supplied or access is denied. As well as assigning levels of clearance to users, mainframe systems can assign varying levels of classification to data files. Clearances and classification are matched to each request.

Controlling access to information on a micro network is more difficult, but users should be positively identified before being allowed on the system. Access to specific data should be authorized and, where sensitive data is involved, monitored:

One simple access-control technique that is workable on a micro network is the password. Several existing microcomputer network products have built-in password protection schemes. No matter what password system is used, to be affective, passwords must be assigned randomly and changed frequently.

Another technique to control unauthorized access on micro networks is the pass card. The pass card is a grown-up version of the credit card containing a self-powered microprocessor plus small amounts of memory. To access the system, the user inserts the card into a pass reader attached to the workstation. The computer checks the card for validity and performs an authorization check. Any attempt to compromise the pass physically or electronically renders the card useless.

To secure a micro net, no single person should have the authority to alter system software or tha ability to circumvent security features without specific clearance. No one should have free access to all files.

If your system demands very tight security, audit programs are an option. An audit program is run after a change or on a regular basis to verify if changes to the network are appropriate. The program checks to see if controls have been bypassed or security compromised.

Modems and gateways to remote computers can offer easy entry to a network by unwanted intruders. A positiva callback system or similar barrier to intrusion is necessary. It is wise to restrict incoming modem access to a dedicated microcomputer not connected to the network, one which contains no important data.

Given the cost and complexity of most encryption schemes, encryption is not a practical option for the ordinary micro network, but it is appropriate in situations where security needs are particuarly high. You can use encryption techniques to protect information during transmission or in storage. Data can be encrypted by special hardware attached to the communications lines or by software within the workstation.

Decryption facilities must be carefully managed. Decryption keys must be kept secure from potential intruders and protected from misuse within the organization. To be effective, the user must be able to change a decryption key at will.

Implementing a new security system begins with training net users. Ignorance of the proper use of the network accounts for a high percentage of network disruptions.

Lehrman is president of Analytic Resources, a microcomputer consulting firm based in Newton, Mass.

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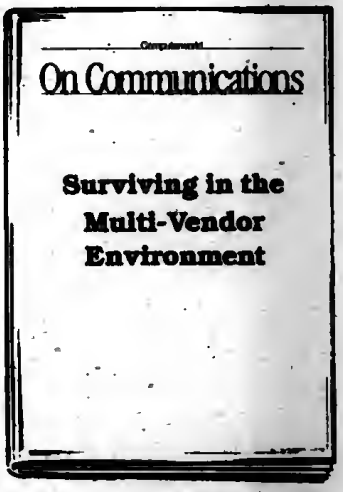

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SPECIAL **REPORT**

Tape method practical way to ensure micro data safety

By Richard Newsome
Special to CW3

The proliferation of microcomputers within large corporations and institutions presents the DP manager with a serious data integrity concern: the backup of microcomputer data.

Fortunately, a variety of specialized data backup methods exist for use with micros. Of the four most commonly used backup media — floppy disks, fixed hard disks, removable hard disks and ¼-in. tape — tape offers the greatest reliability, highest speed and lowest cost per megabyte.

Tape backup is a familiar concept for mainframe and minicomputer users, and it is now becoming accepted for micros. Compaq Computer Corp., for example, includes a backup subsystem in its top-of-the-line Deskpro micro. Sales of ¼-in. cartridge tape drives, the standard for micro tape backup, are rapidly rising.

Users must judge four criteria in their selection of a tape backup subsystem:

- Speed.
- Ease of use.
- Reliability.
- Cost per megabyte of data storage.

Speed is important in facilitating regular backup by nontechnical users. Typical microcomputer users do not want to spend a lot of time backing up their data. In addition, because backup takes time away from applications and prevents users from accessing the hard disk during the process — irksome in a multiuser system — many users see the task as a chore to be deferred.

Streaming tape drives

Of the two types of tape drives available for hard disk backup, streaming and start/stop, the streaming technique offers an important advantage by permitting data to be recorded at a much faster rate. An additional advantage is the increased reliability that stems from streaming tape's continual operation, which requires a less complex and less costly motor.

Ease of use is essential where people who are not experienced DP users will regularly back up data. The method by which data is backed up — mirror image or file-by-file — contributes to making a backup subsystem easy to use. Because each method offers unique advantages, both should be offered on a backup subsystem.

Users are divided in half between preference for mirror image backup, in which an entire disk is recorded on tape at one time, and preference for file-by-file backup, in which individual files are archived.

Of the two methods, mirror image backup is easier to use. A user can initiate the process and then walk away from the computer while the hard disk backs up automatically. Mirror image is most often employed as a fast, fail-safe measure to minimize the loss of data due to disk failure.

File-by-file backup, on the other hand, is most useful in applications where people wish to store files selectively — such as confidential memoranda or employee tax records — from a shared disk. It is best used when only a few files need to be stored.

Reliability of backup subsystems is best evaluated by looking at two factors: data integrity and hardware performance.

Data integrity is ensured by error correction performed after data has been written to tape. Prospective purchasers of backup subsystems should check that the error correction scheme employed does not significantly degrade backup speed. One approach, called verification on the fly, checks transferred data and immediately rewrites it, if necessary, during the recording process. This technique allows users to realize streaming tape's full speed potential.

Hardware performance

Hardware performance may be judged by how many units under warranty must be returned for repair and by how long the manufacturer takes to return them to the field. The shortest usual turnaround — which some manufacturers guarantee — is 48 hours.

In addition, users of combination hard disk/streaming tape units should be certain they can restore data from the tape to a disk other than the one originally backed up. If they cannot, they will be in trouble if their hard disks fail.

Cost is also important to streaming tape backup. Most microcomputer backup subsystems use industry-standard ¼-in. cartridges, which offer a low cost per megabyte compared with other media such as floppy disks.

Recently, some backup subsystem manufacturers have introduced products that employ less expensive drives using alternative media.

The lower cost of a cassette drive makes tape backup practical for many more applications than a cartridge-based backup subsystem can handle.

Newsome is vice-president of marketing for Syspen, Inc., a manufacturer of streaming tape backup subsystems.

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COMMUNICATIONS

IBM's SNA celebrates 10th anniversary

DATA STREAM
John Dix
CW Senior Editor

IBM marked the 10th anniversary of its Systems Network Architecture (SNA) recently, saying that customers are using SNA on more than 20,000 host processors.

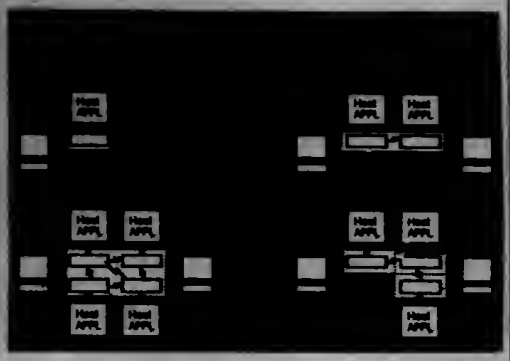
In prepared remarks, Edward H. Sussenguth, one of the early developers of SNA and now an IBM Fellow at Research Triangle Park, N.C., noted that "one of the primary motivations behind the creation of SNA in the early 1970s was the advent of distributed data processing and so-called 'intelligent' terminals."

The seven-layer network architecture was designed, and has been updated over time, to provide flexibility in networking (see diagram).

The evolution of this de facto industry standard network architecture has broadened its applications and appeal. Milestones in its maturation include the following:

- March 1975: The second release of SNA was able to support remote communications controllers with Synchronous Data Link Control (SDLC) links.
- December 1977: The introduction of new SNA products made possible the interconnection of IBM 3705 front-end processors, allowing multiple hosts to exist in the same network and terminals attached to one host to access applications on other network hosts.
- June 1979: A new SNA release provided better network

See SNA page 96



The diagram above graphically depicts IBM's Systems Network Architecture (SNA), as it was used when first announced in 1974, and enhancements that were made over the years.

In 1974, SNA was only supported on single hosts, allowing terminals to access multiple applications for the first time. In 1978, multiple hosts could be supported in a single SNA network, providing for host-to-host sessions and enabling terminals to access applications on different hosts.

In 1980, multiple links between front-end controllers allowed better network load balancing and network availability.

As shown in the last configuration, in late 1983 IBM announced cross-domain software products that made it possible to interconnect individual SNA networks.

Managers' PBX, network decisions exhibit growing reliance on vendors

MOUNTAIN VIEW, Calif. — While 40% of information systems managers plan to install private branch exchanges (PBX) in the next year, their plans are based more than ever on vendor-supplied information and a tendency to stay with the best-known vendors.

Those were among the findings of an Input study of local-area network and PBX trends and decision patterns. The report was based on interviews with managers and vendors and data from earlier reports.

"A typical user explanation of the planning process is 'Well, we get together in the group, talk about the problem, then go with the vendor we know the best.' There is an increasing reliance on vendor information. Vendors provide network design and other value-added services that users often have neither the skills nor the time to approach. The reliance is potentially dangerous, since sales representatives or systems integrators cannot always be objective," the report stated.

Input said that with the growing view of the corporate network as an asset and the demand for services, network or PBX purchase planning should involve the following key steps:

- Keep staff involved and management informed.
- Review the status quo regarding cost, methods, patterns and equipment.
- Review company growth projections.
- Prepare a needs assessment study regarding equipment replacement, user and manager surveys and special requirements.
- Integrate telecommunications and office automation planning.
- Analyze the availability of funds.
- Analyze the acceptance or animosity toward changes in the communications and office automation structure.
- Study vendor information and features, visit trade shows, hold peer group discussions

See STUDY page 92

Lata map available

A poster-size map of Local Access and Transport Areas (Lata) is now available from CCMI/McGraw-Hill, Inc. for $10.

The map, which measures 23 by 29 in., shows the boundaries of all 187 Latas and is segmented into the seven regional telephone holding companies.

In addition, the poster has a table listing the Latas in numerical order, with major city names or geographical descriptions.

The map is available from Customer Services, CCMI/McGraw-Hill, 50 S. Franklin Tnpk., Ramsey, N.J., 07446.

- Xerox Computer Services Division demonstrated here recently a low-cost, two-way satellite communications system/86
- AT&T Network Systems announced two additions to its Dataldit Virtual Circuit Switch family at Localnet/84/86
- Digilog, Inc. has introduced a centrally controlled network management system designed as an overlay for existing networks/86

INSIDE

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"MY FAVORITE MODEM"
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The POPCOM works well with practically any data communications program from the simplest to the most complex.

This modem offers extraordinary reliability and performance.
Smartmodem 1200

We couldn't have said it better

PRENTICE
POPCOM

Xerox satellite allows bypass of telephone circuits

GREENWICH, Conn. — Xerox Corp. Computer Services Division demonstrated here recently a low-cost, two-way satellite communications system that can be used to connect customers' terminals, personal computers or laser printers to Xerox's Hawthorne data center in California.

Customers that opt to use the new delivery service will buy or lease 4-ft satellite dish antennae that can be installed on their premises, enabling the complete bypass of phone company circuits.

These small dishes were reportedly developed by Xerox in conjunction with Telcom General Corp. and are being manufactured by General Instrument Corp.

Each satellite-supported customer will be connected to the 16.4-ft ground station at Xerox's processing center through satellite capacity provided by GTE Spacenet Corp.

Two-way data traffic through such small customer earth stations is achieved by use of the high-powered 72-MHz Ku-band transponders on the hybrid Spacenet 1 satellite launched last May, and employment of spread spectrum technology, according to Michael Faber, National/European operations manager for Xerox Computer Services.

The system enables customers' terminal and peripheral equipment to send data to the Xerox processing center at 2,400 bit/sec and receive data from hosts at the center at 56K bit/sec.

Will support IBM 3274 controller

Faber said the service will typically be used to support IBM 3274 controllers and associated devices in a Systems Network Architecture Synchronous Data Link Control environment or perhaps an IBM Personal Computer AT supporting one or two terminals. The maximum number of connected devices depends on the response time desired, he noted.

The higher speed connection from the Xerox center to the customer site is made possible by the large earth station on the host side. That 56K bit/sec link will reportedly enable software to be downloaded quickly to customers' small dish antennae, which, according to Faber, will be leased for $200 to $300 per month. The 56K bit/sec link will also enable the company to provide one-way video transmission for customer education seminars, he added.

The delivery system is being tested now and is scheduled to be available to Xerox Computer Services customers early next year.

The company is located at 5310 Beethoven St., Los Angeles, Calif. 90066.

Dial-in service lists AT&T rates

GREAT NECK, N.Y. — Contel Information Systems, Inc. has announced a dial-in service that provides network designers with price information on interstate AT&T private lines.

Mind-Pricer reportedly allows network planners to access the service through any Ascii terminal or personal computer with a modem and request pricing information for point-to-point and multipoint circuits.

The system reportedly prompts the caller to type in the area codes and exchanges for points in the circuit and then provides on-screen lists of costs for line charges and termination charges for analog, digital and T1 circuits, according to Contel. It reportedly provides similar listings for pending AT&T rate proposals.

There is a $500 annual license fee and a minimum $25 monthly access charge for the service.

Contel is located at 130 Steamboat Road, Great Neck, N.Y. 11024.

AT&T Network Systems extends Datakit VCS line

SAN DIEGO — AT&T Network Systems announced two additions to its Datakit Virtual Circuit Switch (VCS) family at the Localnet-84 Conference here.

The Datakit VCS will be distributed by the divested Bell operating companies and other resellers, according to AT&T.

The modular switches were reportedly designed to provide terminal-to-computer and computer-to-computer communication in wide- and local-area applications.

According to the company, Datakit is wired like a star topology, providing virtual circuits over an 8M-bit/sec centralized short bus.

The new VCS models are aimed at users who are larger and smaller than those targeted by the original 400-user Datakit VCS. They are the Datakit VCS Model 500, designed for small businesses needing 100 or more connections among remote and satellite locations, and the Datakit VCS Model 2000, which offers up to 2,500 virtual circuits.

Both models reportedly use six- and 12-port modules designed for flexible configuration and low per-port costs. The Model 2000 is available now, and the Model 500 will be available in June.

Prices for the switches are being set by the regional telephone holding companies and others who contract to distribute them. Bell Atlantic reported that it is pricing all of the switches at $1,000 per port for fewer than 100 ports, $500 to $650 (depending on configurations) per port for 100 to 250 ports, $350 to $450 per port for 250 to 750 ports and $300 to $350 per port for 750 or more ports. Adding ports to an existing system will cost $200 to $250 per port.

AT&T Network Systems is located at 222 Broadway, New York, N.Y. 10007.

Digilog unveils MDTS network management system

MONTGOMERYVILLE, Pa. — Digilog, Inc. has introduced a centrally controlled network management system designed as an overlay for existing networks.

The Digilog Modem Diagnostic Test System (MDTS) reportedly adds intelligence to any vendor's modem for automatic digital and voice frequency alarming, modem and terminal status checking, remote testing and streaming device detection and correction.

The MDTS is said to be controlled under a special program for the IBM Personal Computer. The controller maintains the system data base, which contains information on circuits and drops in the system. According to the vendor, user-defined names for each operation eases operation.

Monitors network modems

The central workstation monitors network modems and maintains a record of alarm conditions, functions said to permit the user to enable or disable each monitor function selectively, set high and low limits for alarm processing and check the state of each monitoring function, according to the vendor.

The operator reportedly can command individual modem tests, including digital and analog loopbacks, bit error-rate tests, polling tests, analog level measurements and self-tests.

The wrap box interfaces with virtually any four-wire, leased-line modem operating in the 1,200 bit/sec to 9,600 bit/sec range, according to the vendor.

Depending upon network configuration, the price ranges from $3,990 to $15,975.

Digilog is located at 1370 Welsh Road, Montgomeryville, Pa. 18936.

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Recommends Racal-Vadic Modems

When it comes to communications, Racal-Vadic is a leader.

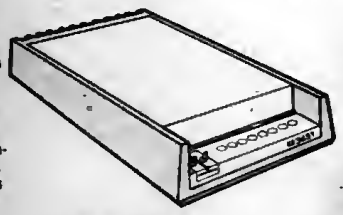
Racal-Vadic's complete line of modems, acoustic couplers and accessories comprehensively addresses the broad range of low- and medium-speed communications requirements.

DJC stocks all of Racal-Vadic's communications products, including the RV3451 triple modem, the Auto-Dial VA212 and the VA212LC, and the new Maxwell line of modems, specifically designed for personal computers. Availability in both 300 and 1200 baud and internal and stand alone models, the Maxwell is fully featured to fill all your PC communication needs.

DJC can satisfy all your data communication problems. We handle a comprehensive selection of devices and equipment, and have the experience to show you how to connect them all.

DJC is an authorized distributor for Racal-Vadic, Micom, General Datacomm, Protocol Computers, Anderson-Jacobson, Biacomp and Ventel.

Next time you need Racal-Vadic, or any other solution to your data communication needs, do yourself a favor—call DJC.



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For Candle's IMS Performance Monitoring Software

Two years ago, Candle made a strategic decision about the design of our IMS performance products: to support a mode of operation we call External Monitoring (EM). We did this for both short and long-range reasons.

Reliability and Ease of Use

Short-range, EM made our products easy to install and highly reliable. Because Candle's IMS products run in their own MVS address space, they can be installed in less than one hour with no modifications to IMS – not even a scheduled restart. Extensive loop checking, error recovery and other integrity features are provided, so that Candle products can continue to run even during severe hardware and software problems (such as VTAM disabled).

IMS Growth Strategy

Long-range, EM anticipated the need for IMS to grow both horizontally and vertically: Horizontally, through the multiple-address-space architecture of IMS 1.3. Vertically, above the 16 MB line in the MVS/XA address space.

IMS 1.3 and MVS/XA Support Now

As a result, Candle IMS performance products can fully exploit the capabilities of both IMS 1.3 and MVS/XA. At the same time, we were able to deliver support for IMS 1.3 very close to IBM's first customer shipment – not just compatibility but support for DBRC, IRLM, and DLISAS address spaces. When dozens of new commands were needed to support IMS 1.3 we were able to implement them quickly because we were prepared for the new architecture and did not depend on system hooks or IMS exits.

Future Direction

For the future, the direction of IMS is clearly toward extending the multiple-address-space architecture of IMS 1.3 to support other high-traffic services (such as Message Format Services). The future belongs to those who prepare for it.

If you want IMS performance tools now that support current and future systems software promptly, you need Candle. For more information, contact your Candle representative.

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Dept MI, 10880 Wilshire Blvd., Suite 2404, Los Angeles, CA 90024

A-283

ITT upgrades voice-only PBX, unveils workstation

RALEIGH, N.C. — ITT Telecom Products Corp. recently announced plans to upgrade the firm's voice-only 3100 private branch exchange to support data and unveiled an integrated voice/data workstation.

The upgraded System 3100D, ITT reported, can be used to network other ITT products, including printers, personal computers, workstations and IBM 3270-compatible controllers and terminals.

The System 3100D is reportedly microprocessor-based, has a distributed architecture and is expandable from 48 to 288 ports. It is said to support asynchronous speeds up to 19.2K bit/sec, perform speed and format conversion and provide automatic data call setup.

According to ITT, the system's modular design makes it suitable for large and small users, including those without telecommunications or data processing expertise.

The company said that terminals can be connected via RS-232C and RS-422 interfaces to the system, which is nonblocking for up to 180 ports. Other switch features include station message detail recording, least cost routing, direct inward dial, direct systems access, intercom, paging and conferencing. The 3100D is said to provide X.25 packet switching interface as a flexible network communications link to host computers.

Customers with a voice-only System 3100, originally introduced in 1981, can reportedly upgrade to the 3100D by changing station cards.

Scheduled for delivery in the first quarter of 1985, the 3100D costs from $700 to $900 per line. It will be distributed by ITT direct sales offices, authorized distributors and regional telephone holding companies.

Products designed to run with the 3100D include the IBM 3270-compatible ITT Courier 9000 series of terminals, controllers, matrix and line printers announced earlier this year. One of those terminals, the ITT 9232 amber monochrome extended function display terminal, was announced recently and will be available in November for $2,230.

ITT Telecom Products also unveiled an integrated voice/data workstation that integrates an advanced feature telephone, a data terminal, an internal modem, a detachable keyboard and personal business support software, the company said. It costs approximately $1,000.

Other products fitting into the ITT communications system are the ITT Xtra, an Intel Corp. 8088-based 16-bit personal computer with up to 640K bytes of memory and running on ITT DOS 2.11; and ITT Qume video terminals and printers.

ITT Telecom Products is located at 3100 Highwoods Blvd., Raleigh, N.C. 27604.

Sherlock module to offer ATM encryption

RESTON, Va. — Analytics Communications Systems, Inc. has announced the Sherlock ATM network security module, an encryption device for automatic teller machines (ATM).

The Sherlock ATM security module uses the National Bureau of Standard's Data Encryption Standard and is said to provide encryption of personal identification numbers, full message encryption and Ansi message authentication. The module also uses a unique cryptographic key on each drop in a multidrop circuit to increase security, the company said.

The Sherlock module has self-test diagnostics and is said to minimize the effects of failures in the network. The Sherlock product also automates secure code key management through the company's Authenti-Key solid-state key transport device, said to distribute key variables securely that are unknown to programmers, operators and customers.

The security module has Cmos memory, which retains keys and operating parameters with battery backup in the event of power disruption. When attempts to tamper with the ATM enclosure are detected, the tamper detection circuitry drops the power, erasing all memory, the company said.

The module operates at speeds up to 9.6K bit/sec in either asynchronous or synchronous modes, half or full duplex. The price per ATM for the Sherlock module is approximately $2,000, the vendor said.

Analytics Communications Systems is located at 1820 Michael Faraday Drive, Reston, Va. 22090.

IRMA introduces a CICS file transfer system that will end PC-to-mainframe monkey business.

CONTROLLERS

CONTROL DATA CORP.
Loosely Coupled Network price cuts

Control Data Corp. has announced a 40% price reduction on its Loosely Coupled Network communications hardware products.

The price was reduced from $44,000 to $25,750 for most Network Access Devices, including those available to interconnect CDC, IBM and Digital Equipment Corp. mainframes.

The vendor's network is said to enable users to interface numerous co-located mainframes, utilizing 50M bit/sec trunks. With the Loosely Coupled Network, a processor connects into the network through one or more Network Access Devices. Up to four trunk connections per device can be configured to provide redundant paths and higher levels of performance, the vendor said.

CDC, 8100 34th Ave. S., Minneapolis, Minn. 55417.

NCR COMTEN, INC.
CNS3 Release 1

NCR Comten, Inc. has announced an enhancement to its Communications Networking System said to increase users' data communications network trunking capabilities and flexibility.

CNS3 Release 1 reportedly expands the features of CNS, a network product that concentrates data from remote locations and transmits it over trunk lines to a central location for processing. CNS3 reportedly handles up to 128 simultaneous transmissions.

The software resides in the vendor's 3600 communications processor and is required in each 3600 processor linked into the network, the vendor said.

The license fee for CNS3 is $120/mo or $1,320/year.

NCR Comten, 2700 Snelling Ave. N., St. Paul, Minn. 55113.

VOICE/DATA COMMUNICATIONS

CMQ COMMUNICATIONS, INC.
Multiport II

CMQ Communications, Inc. has announced an interactive terminal system designed to provide access to multiple host computers.

Multiport II includes the 2700 control unit and the 2750 VDT. The control unit connects up to eight 2750 terminals and two serial printers to multiple local or remote hosts through leased lines or packet-switched public data networks, according to the vendor.

Host port interfaces include IBM 3270 Binary Synchronous Communications, X.25, synchronous, asynchronous and a multilink feature said to allow communications ports to be connected to multiple control units for larger terminal populations.

The video display unit has a standard 12-in. green phosphor monitor and an 80-char. by 24-line screen format and features blink, dual intensity, protected field, numeric field, attribute wraparound and 96 Ascii characters.

Now available, the control unit costs about $4,600, and the terminal costs about $1,375.

CMQ Communications, 60 Yonge St., Toronto, Ont. M5E 1H5.

ADALOGIC, INC.
Gateway-DB; Gateway-FM; Gateway-EMDB

Adalogic, Inc. has introduced three models of its Gateway dial-up computer security system.

The models reportedly have additional memory to handle up to 200 users. The Gateway-DB reportedly provides for up to 20 identification codes and passwords; the Gateway-FM allows up to 200 passwords and ID codes; and the Gateway-EMDB allows up to 135 passwords and offers dial-back capability.

Gateway-DB is priced at $495. Gateway-FM and Gateway-EMDB cost $595.

Adalogic, 559 Union Ave., Campbell, Calif. 95008.

COMMTEX, INC.
Coax LIM; CX-80; X.25 adapter

Commtex, Inc. has announced a line interface module, a printer interface and a plug-in X.25 adapter for use with its CX-80 Data Exchange data switch.

The Coax LIM is said to be a line interface module that permits personal computers and Ascii terminals to be connected to a CX-80 by coaxial cable.

The CX-80 is an interface designed primarily for use with printers, providing a switchable extension port that allows two devices to operate at different speeds.

The X.25 packet assembler and disassembler adapter reportedly enables the CX-80 Data Exchange to act as a gateway to public data nets.

The 10-port Coax LIM costs $850, the CX-80 costs $550 and the X.25 plug-in adapter costs $3,695.

Commtex, 2411 Crofton Lane, Crofton, Md. 21114.

APPLIED INNOVATION, INC.
Alswitch Series 170

Applied Innovation, Inc. has announced a data switching system for minicomputer, microcomputer and mainframe users.

Standard features of the Alswitch Series 170 include host port selection, port contention, dual configurations, autoconnect ports, speed compensation, host security enhancement, a nonblocking design and tandem operation.

Continued on page 92

Far be it from DCA, the makers of the original PC-to-mainframe communications link, to close down the very same information flow we created.

But that doesn't mean we aren't fully aware of the mess that unauthorized use of a PC can cause.

But how do you lock up the secrets without locking horns with PC users with legitimate requests?

Easy. Just get IRMAlink DBX/CICS.

IRMAlink DBX/CICS is a data file transfer system that allows the MIS manager to retain total control of the mainframe's database and, at the same time, gives PC and data center users quick and easy access to the files they need to have.

IRMAlink DBX/CICS' Record Definition function allows the MIS manager to designate which field, if any, can be extracted from a file on the host for transfer to a particular user.

Several record definitions can be easily created for a particular host file with each containing only selected fields from that file.

Data can be even further limited by assigning selection criteria to the records.

IRMAlink DBX/CICS from DCA. It gives users the access they want. It gives MIS managers the control they need.

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MP-02-11

WE JUST TOPPED THE LONGEST RUNNING LINE OF PRINTERS.

The new 5300 family of printers from Teletype Corporation represents an exceptional value. The entire family combines our traditional reliability with a 200 cps speed that is ideal for business applications. You can choose a keyboard or auxiliary printer, both of which are available in 15-inch tabletop and 9½-inch compact sizes.

From the moment you take a 5300 out of the box and plug it into your system, you'll be amazed at how easy it is to operate. To begin with, you can downline load or simply push a button on the printer's control panel to set options. And just push another button to select an alternate option set for a different system. A 4-character LCD on the control panel provides all of the status indicators you need.

The 5300 is available with a built-in 300/1200 baud modem that saves desk space and makes it possible for the 5300 to do all dialing and logon functions. So you can access a CPU or timesharing network by simply depressing a key on the detached keyboard.

For printing versatility, the 5300 is hard to beat. It features graphics capabilities as well as emphasized, expanded and compressed printing. And when used as an auxiliary printer, the 5300 is well-suited for use with most ANSI display-based terminals such as the Teletype® 5410 and 5420.

You'll also appreciate the forms handling of the 5300. It is available with adjustable push or pull tractors; a roll paper holder, a supply rack and an accumulator.

Other features that make the 5300 an even better value include an interchangeable platen, acoustic adapter and a carrying case for the 9½" model.

The 5300 also has a built-in self-diagnostic system that lets you know when and where problems exist. And if you can't solve the problem, you can count on our product service organization for help. With offices nationwide, we're able to offer fast response time.

So if you'd like a printer that tops what you have now, check out the latest in our long-running line. Write Teletype Corporation, 5555 Touhy Avenue, Dept. 3223-F, Skokie, IL 60077. Or call 1 800 323-1229, ext. 701.

TELETYPE: VALUE SETS US APART.

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AT&T
Teletype Corporation

VTAM.

NETSPY™ is a Network Performance Monitor that runs under MVS and VTAM, version 2, and allows users to monitor all or selected VTAM applications.

NETSPY provides response time and traffic statistics per application and per terminal. It provides three levels of response time: last, worst and average.

For applications using the SNA definite response mode protocol, such as most TP subsystems including TSO and IDMS, NETSPY provides the network delays necessary for each transaction.

NETSPY displays its monitoring of response times and traffic statistics from a NCCF 3270 screen or a TSO command processor. It can also provide statistics on 3705 CPU and buffer storage usage.

In less than one hour, you can install and start using NETSPY on a FREE 30-day trial. Call (312) 525-6400.

Chicago Soft

738 N. LaSalle/Chicago, IL 60610
TWX 910-997-5857

COMMUNICATIONS

Continued from page 89

A 16-port switch costs $5,550, and a 32-port switch is priced at $7,150, according to the vendor.

Applied Innovation, 3764 Sawbury Blvd., Columbus, Ohio 43085.

SOFTWARE

COMMUNICATIONS RESEARCH GROUP
3B Blast

Communications Research Group has released its Blast communications package for AT&T's 3B minicomputer series.

The package is said to provide file transfer and terminal mode access to link the AT&T computers with any other computer running Blast software.

3B Blast costs from $595 to $895.

Communications Research Group, 8939 Jefferson Highway, Baton Rouge, La. 70809.

MULTIPLEXERS/MODEMS

MICOM SYSTEMS, INC.
Dialnet3000 Model 3024+

Micom Systems, Inc. has announced an autodialing, 2,400 bit/sec, full-duplex modem said to allow automatic logon to a host computer.

The Dialnet3000 Model 3024+ reportedly uses a design that combines a digital signal processor chip with semicustom Cmos circuitry.

It provides CCITT V.22 compatibility at 2,400 bit/sec and has a secondary mode with 1,200 bit/sec AT&T 212 compatibility. Up to 20 numbers can be stored in the autodial memory, which also holds automatic logon sequences in nonvolatile memory.

It is available as a modem, the Model 3024+, for $895, or as a card module, the Model 3224+, for $845.

Micom Systems, 20151 Nordhoff St., Chatsworth, Calif. 91311.

MICOM SYSTEMS, INC.
Dialnet3000 Model 3012T+

Micom Systems, Inc. has introduced an autodialing modem said to provide compatibility automatically with AT&T 212A, Racal-Vadic, Inc. 3400 and AT&T 103 modems in the originate and answer modes.

The Dialnet3000 Model 3012T+ is compatible with the AT&T 212A and Racal-Vadic 3400 at 1,200 bit/sec and with the AT&T 103 at 300 bit/sec.

It is intended for customers who need to access multiple host computer systems, for polling remote sites after working hours and for supporting an installed base of the compatible modems.

The modem comes as a stand-alone desktop package, Model 3012T+, or as a card module, Model 3212T+, for use in a rack-mount chassis.

As a stand-alone unit, it costs $795;and $745 as a card module.

Micom Systems, 20151 Nordhoff St., Chatsworth, Calif. 91311.

See MODEM page 98

The UNIMUX 832 provides 128 ports of fiberoptic firepower for total systems solutions in voice management, data processing, and office and factory automation. The UNIMUX 832 is a universal time division multiplexer so multidisciplined, it has *solutions looking for problems to solve.* For limited-distance multiplexing in large data centers, or high density LAN nodes where bulk hauling of voice and data presents major problems, the UNIMUX 832 offers more ports-per-system, higher data transmission, and fully independent ports. Your needs are met for easy integration, complete network flexibility, and cost-effective expansion.

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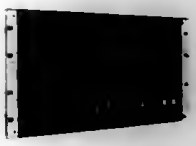

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STUDY from page 85

and on-site reviews.

When it comes to planning, telecommunications professionals are confused by the deregulation of the telecommunications industry, the breakup of AT&T, the increasing number of choices created by the new competitive environment and the increasing number of choices created by new technologies, the report said.

The survey found that 90% of those who plan to install new, additional or replacement PBX equipment in the next year plan to select a digital PBX and that 70% plan to integrate voice and data.

The report added that more than half will use the equipment as a local-area network or will connect it to a local-area network.

The report is available for $1,450.

Input is a software and services planning firm located at 1943 Landings Drive, Mountain View, Calif. 94043.

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WYSE

DIGITAL DISPLAYS THE TERMINALS BEST ENGINEERED FOR BUSINESS.

Before you make any investment in business graphics terminals, it really pays to investigate what you'll be using them for.

If you're like most businesses, your terminals will be used approximately 70% of the time for generating text and numbers. And only around 30% of the time for strictly graphics purposes. The October 1983 *Infosystems* article, "How to Buy Graphics Displays," coauthored by Jim Warner, CEO of Precision Visuals, Inc.,® states, "While it may be true that one picture (chart, graph) is worth a thousand words, there will always be the need for words, thousands of words, in the day-to-day activity of the office. Special graphics-only devices can have limited value in a general office environment."

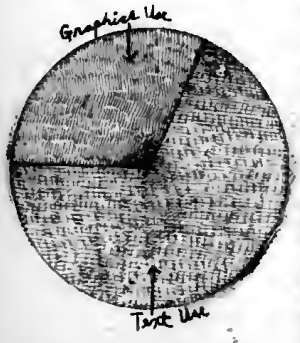
At Digital, the first step in engineering every product we make involves a thorough analysis of who will use it, what it will be used for and which features will help make people more productive in their jobs.

That's been true of every terminal we've designed and helps explain their widespread acceptance and popularity.

And you'll find it's equally true of Digital's latest entries, the VT240™ and VT241™ terminals.

ENGINEERED BEST FOR WHAT YOU NEED MOST.

As the newest members of Digital's family of terminals, the VT240, a conversational



text and graphics terminal, and the VT241, with the added dimension of color, continue the tradition of engineering excellence for performance. They offer full VT100™ compatibility to take advantage of a host of offerings already developed. And to meet the needs of the business environment, you'll find a set of standard text features that are either unavailable on other terminals or may have to be purchased at an additional cost.

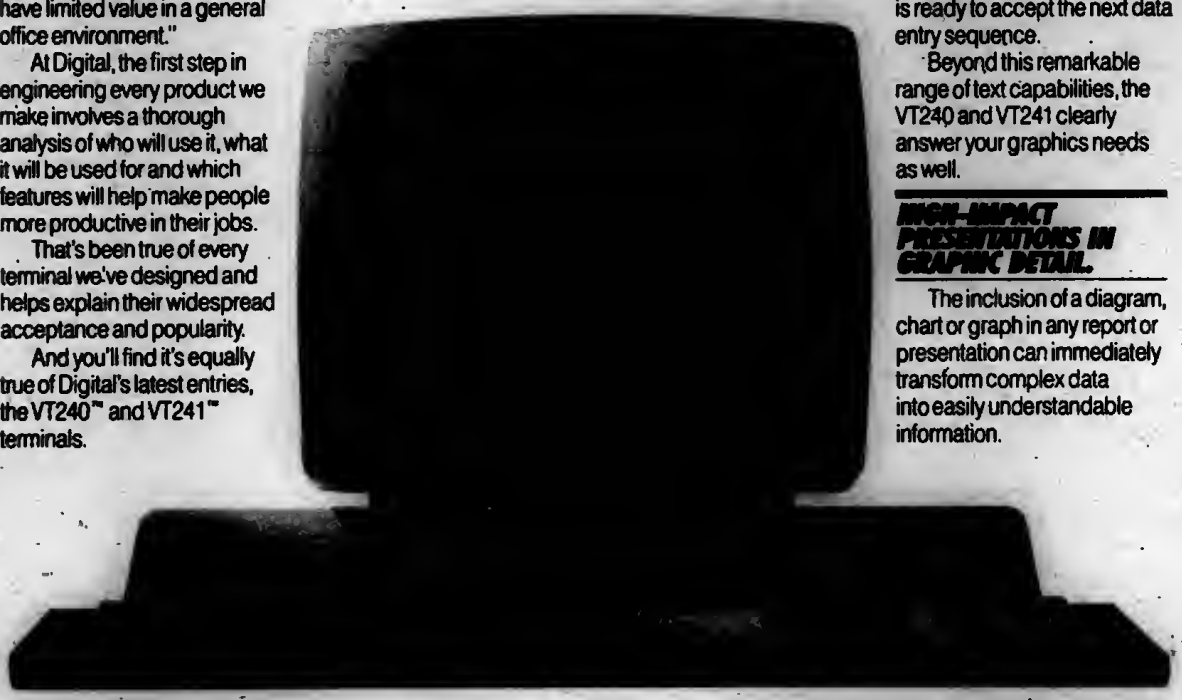
These features include bidirectional smooth scrolling, split screen, a choice of 80 or 132 columns per line and a double width/double height format. A highly legible 8 by 10 dot matrix character font displays true ascenders and descenders for exceptional crispness and legibility. If certain information needs to be highlighted, you can select from a combination of bold print, blinking and underlining in either normal or reverse video. For your added convenience, there's even a built-in printer port for printing hard copy.

Both the VT240 and VT241 terminals give you the option of erasing selected character positions on the screen for more efficient communications and increased productivity. For those applications that require data to be entered by filling in the blanks of a form, once the data has been accepted by the host, the filled-in information—and only that—can be erased by means of a single command. The form itself remains up on the screen and is ready to accept the next data entry sequence.

Beyond this remarkable range of text capabilities, the VT240 and VT241 clearly answer your graphics needs as well.

HIGH-IMPACT PRESENTATIONS IN GRAPHIC DETAIL.

The inclusion of a diagram, chart or graph in any report or presentation can immediately transform complex data into easily understandable information.



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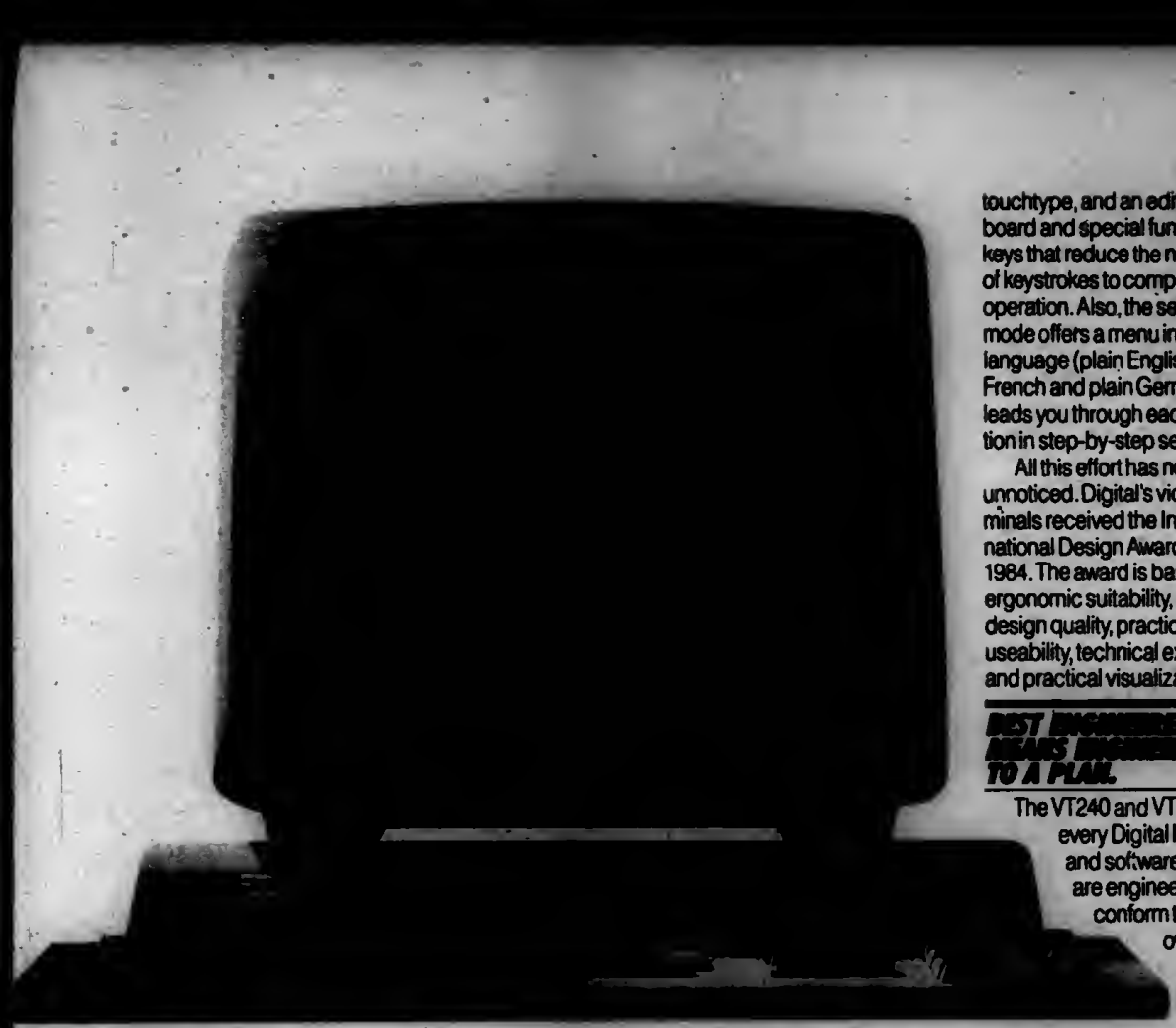


touchtype, and an editing keyboard and special function keys that reduce the number of keystrokes to complete an operation. Also, the set-up mode offers a menu in plain language (plain English, plain French and plain German) that leads you through each operation in step-by-step sequence.

All this effort has not gone unnoticed. Digital's video terminals received the International Design Award in 1984. The award is based on ergonomic suitability, safety, design quality, practical useability, technical excellence and practical visualization.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

The VT240 and VT241, like every Digital hardware and software product, are engineered to conform to an overall computing strategy. This means our products are engineered to work together easily and expand economically. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

For more information and the name of the Authorized Terminals Distributor or Digital Representative near you, call 1-800-DIGITAL, extension 700. Or write Digital Equipment Corporation, 2 Mount Royal Avenue, UP01-5, Marlboro, MA 01752.

Both the VT240 and VT241 terminals generate bit map graphics in a choice of two protocols—Digital's ReGIS™ (Remote Graphics Instruction Set) and Tektronix 4010/4014.™

ReGIS lets you create and store business graphics as simply as producing ASCII text. With VAX-11 DECgraph™ and VAX-11 DECslide™ software, even a novice can prepare graphs and charts and turn them into slides. Self-explanatory icons let you choose a box, circle, line, polygon, triangle or arc.

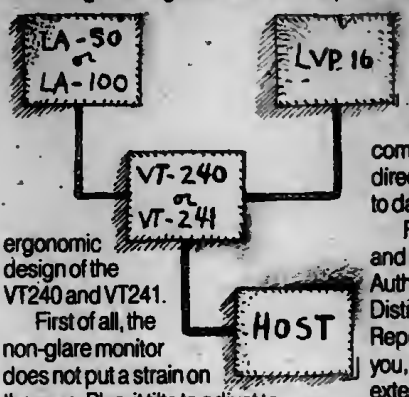
The Tektronix 4010/4014 protocol supports the full array of existing 4010 compatible graphics software. Besides, Tektronix Plot 10,™ TELL-A-GRAF™ and DISSPLA™ from ISSCO® and DI-3000,™ GRAFMAKER™ and GRAFMASTER™ from Precision Visuals are also supported.

When you're using third party software, Digital provides you with the total hardware/software solution: video terminals, hard copy with the LVP16™ Pen Plotter and the VAX™ computer.

THE HIGHEST AWARD FOR ERGONOMIC DESIGN.

Your people have to spend long hours in front of a terminal. It stands to reason the easier they are to use, the more productive the results.

That's why so much time and thought have gone into the ergonomic design of the VT240 and VT241.



First of all, the non-glare monitor does not put a strain on the eyes. Plus, it tilts to adjust to the exact viewing angle that's most comfortable to work with. The detachable keyboard is ruggedly constructed, yet light enough to place on your lap. Even the way the keyboard has been arranged boosts productivity.

There's a standard typewriter keypad so you can

THE BEST ENGINEERED COMPUTERS IN THE WORLD

digital™

MODEM from page 92

TIMEPLEX, INC.
Prophet Network Management System

Timeplex, Inc. has introduced a software package for the IBM Personal Computer designed for network configuration and monitoring of Microplexer switching multiplexer networks.

The Prophet Network Management System is said to support design, configuration, real-time network monitoring and diagnostic functions. The package, when connected to the vendor's Microplexer switching reportedly offers complete single-point control of the overall network, as well as individual ports.

The Prophet system combines statistics with network topological diagrams, port buffer utilization charts and port profiles to produce an up-to-date picture of the entire network, the vendor said.

In configuring the network, Prophet is said to allow the manager to define the complete set of parameters for each multiplexer exchange, or node, before connection to the exchange for programming. Internal checks validate the changes, the vendor said.

Prices start at $5,000.

Timeplex, 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

LOCAL-AREA NETWORKS

UNGERMANN-BASS, INC.
Net/One Local Bridge enhancements

Ungermann-Bass, Inc. has announced enhancements for its Net/One Local Bridge, designed for interconnecting Net/One communications systems in a building or campus environment.

According to the vendor, the enhanced bridge increases the rate of data transfer between networks by more than 600% over the previous version.

The local bridge, consisting of network access hardware for each of two linked nets and a Motorola, Inc. 68000 microprocessor, costs $9,850. Local bridge software costs $1,000 per bridge.

Ungermann-Bass, 2560 Mission College Blvd., Santa Clara, Calif. 95050.

SNA from page 85

management tools, including the Network Communication Control Facility and the Network Problem Determination Application.

- July 1981: A network control program and interconnection adaptor are unveiled that enable SNA products to be connected to public value-added nets.
- July 1982: Reflecting the emergence of micros, Advanced Program-to-Program Communications is released to provide communications between applications on devices considered to be peers.
- November 1982: Document Interchange Architecture and Document Content Architecture, formats that specify what can be thought of as the envelope and the letter, respectively, of textual information.
- November 1983: SNA Network Interconnection is announced to allow multiple SNA nets to be connected.
- September 1984: Enhanced software products are released that extend the number of logical device addresses from 64,000 to eight million that can be supported within SNA.

In the future it is likely we will see SNA evolve to become more similar to the International Standard Organization's Open System Interconnect network architecture reference model.

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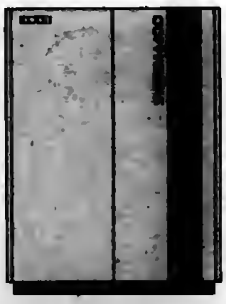

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ELXSI System 6400 has a true native port of UNIX System V, not an emulation. With a unique combination of Berkeley enhancements. Virtual memory. Super fast I/O. Ethernet with TCP/IP. Plus the largest physical memory in the business. ELXSI System 6400 will run either UNIX or our proprietary, message-based EMBOS operating system. Or both, concurrently.

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ELXSI, 2334 Lundy Place, San Jose, California 95131. 408/942-1111, Telex 172-320.

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HARD TALK
CW Senior Editor

Venus to be key product for DEC

After months of promising a high-end successor to its VAX-11/780 line, Digital Equipment Corp. appears to be gearing up to go public with its new product. Some speculators contend DEC may unveil the product as early as this week. DEC has repeatedly stated it plans to unveil the new system before the end of the year.

Sometimes called DEC's Venus project, or VAX-11/790, the high-end system will clearly be a strategic product for DEC. For one thing, the system gives DEC a big chance to smooth the ruffled feathers of Decsystem users who are upset over DEC's decision to kill the Jupiter project, a successor to the Decsystem-10 and -20 mainframes. A high-end system that offers impressive performance over the VAX-11/780 will surely turn some Decsystem users' heads. That, coupled with more software bridges to allow Decsystem users to coexist painlessly with VAX systems, would clearly ease the tensions that currently exist among Decsystem users.

The Venus also gives DEC the potential to tighten its reign on its installed base of VAX users. Virtually every vendor to announce a scientific-oriented processing system in the past two years has compared their new system to the performance of the VAX-11/780. Most claim significant performance improvements over the VAX.

One corporate executive recently noted that with more companies developing computer-based models and simulations, there appears to be no end to a fertile market for big, scientific processors. Furthermore, as companies develop more sophisticated models and simulations, they will need more, and larger, computer systems to process the work. Hence, if the scientific-oriented marketplace is a self-sustaining one, DEC has to do something to differentiate itself from the many other companies claiming to have equaled or surpassed the performance of the VAX line.

Then there is DEC's continuing habit of bumping heads with IBM. Over the past two years, IBM has, in essence, rebuilt its 4300 line with models offering newer technology and greater performance. IBM appears to have replaced its original 4331 and 4341 processors with much more powerful versions, the 4361 and 4381.

Now, some industry watchers speculate, IBM is gearing up to announce an even more powerful 4300 series processor, a dual-processor version of the 4381. In the past, IBM appeared to be comfortable with using the 4300 line for commercial, rather than scientific-oriented, processing. But the 4361 and 4381 products appear to compete more closely with DEC's VAX line than ever before. Consequently, to remain competitive with IBM, DEC needs a more powerful version of the VAX.

Also, bear in mind that while DEC has

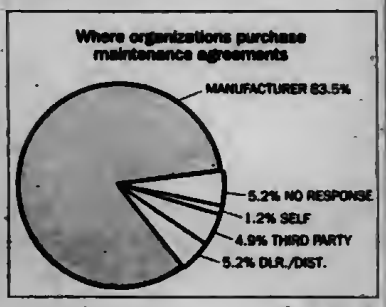
See VENUS page 102

Survey tallies service options for computer system users

By John Desmond
CW Staff

FRAMINGHAM, Mass. — Manufacturers still provide service to 83.5% of computer system users, but independent maintenance firms have the potential to attain more than their current 4.9% market share measured in a recent survey of 382 computer users.

The survey, conducted by International Data Corp. (IDC), a market research and consulting firm here, focused on users with minicomputers and general-purpose systems. Of the respondents, 72 are in manufacturing, 47 are in wholesale or retail and 47 are in education and research. Highlights of the survey included the following:



COPYRIGHT 1984 IDC

■ Five percent of users returned to the dealer or distributor for service, and 1.2% chose to do their own service.

■ The most popular type of contract is a premium service or full contract, purchased by 66.9% of respondents from manufacturers and by 51.7% of those using independent maintenance firms. The next most popular type of contract is a basic service contract, chosen by 24.5% of respondents from manufacturers and by 27.6% from independents.

■ Desired response time for normal service is four hours, and desired response time for emergency service is two hours. IDC said the manufacturers' customers arrived on time in 68.3% of cases, and the independents' customers arrived on time in 50% of cases.

■ Reliable equipment, availability of spare parts and the field service organization were considered most important by respondents ranking most important aspects of service. The highest ranking manufacturers for service were Digital Equipment Corp., Hewlett-Packard Co. and IBM.

■ Inability to reach the proper person when reporting a problem, inability to obtain a firm estimated arrival time of a technician and inability to obtain the actual arrival time of a technician were the biggest complaints of respondents about telephone contact with service organizations.

■ Hardware repair, emergency repair during contract hours, quality of service and rapid service response were the most critical service factors listed by all respondents. For each category, the service organizations failed to meet user expectations, the survey found.

■ For 24% of respondents, the service received was judged to be greater than the price paid, while for 30%, the quality of service was judged to be below the price paid.

■ The cost of maintaining CPU systems fell between 1% and 10% of the system cost for 58% of respondents.

■ Users would add or extend the following options if given the choice: guaran-

See IDC page 100

■ American Information Systems Corp. has unveiled a 32-bit supermicrocomputer for Digital Equipment Corp. Q-bus users/96

INSIDE

Turnkey Systems/98
Processors/98
Data Storage/99
Terminals/99

Stratus releases modules for its fault-tolerant line

MARLBORO, Mass. — Stratus Computer, Inc. unveiled a series of packaged modules for its FT 200 and XA 400 product lines which the company claims gives users an option to migrate up the company's product line of fault-tolerant transaction processing systems. At the same time, the vendor announced a streaming tape drive for its line of systems.

The packaged configurations feature an expanded

See STRATUS page 101

Honeywell terminals boast better visibility

WALTHAM, Mass. — Honeywell, Inc. has announced four additions to the VIP 7800 series of editing terminals: the VIP 7816, 7826, 7817 and 7827. The units were designed for use with Honeywell's medium- and large-scale mainframes.

Each of the newly announced terminals can operate in text and form mode to emulate Honeywell's VIP 7705E terminal and the firm's VIP 7800 terminals in either synchronous or asynchronous communications modes, the company said.

See VIP page 101

AIS supermicro announced for systems using Q-bus

PALO ALTO, Calif. — American Information Systems Corp. (AIS) has unleashed a 32-bit supermicrocomputer system that offers 16M bytes of uniform virtual memory, multiple processors and AT&T's Unix-based or Pick and Associates, Inc.'s Pick operating system.

The system was designed for users of existing computer systems using Digital Equipment Corp.'s Q-bus. These include DEC's PDP-11 and LSI-11 systems.

Called the AIS/3210-A Bus Master System, the unit can perform as a stand-alone system in full control of all Q-bus peripherals, the company said. The unit can be inserted into the first slot of the Q-bus chassis, replacing the PDP-11 processor without changing the peripherals of the system.

The AIS/3210-AE Enhancement System requires a bus-master processor. This multiple processor system may use either the PDP-11 or the AIS/3210-A as the host processor. It uses the bus-master processor to perform all Q-bus I/O operations, the vendor said. Any terminal, file or I/O device of the host processor can be linked directly to the AIS/3210-AE Unix-based system for program execution or used with the host processor without restrictions.

With a PDP-11 or AIS/3210-A as the host processor, the user has the capability for concurrent task operation on both the host and the AIS/3210-AE, the vendor said. All peripherals on the Q-bus — physical memory, disk and tape drives, printers and plotters — may be shared by both the host processor and AIS/3210-AE. All Q-bus I/O is initiated and controlled by the host processor.

AIS/3210 systems currently include three primary segments of systems software: a Unix-based operating system for both system versions, a Virtual Input/Output System and a host I/O processor for the AIS/3210-AE.

The price of $6,900 includes the boards bundled with the system software.

More information is available from American Information Systems, located at 1801 Page Mill Road, Palo Alto, Calif. 94304.

TURNKEY SYSTEMS

INTERLEAF, INC.
TPS-2000 Technical Publishing System

Interleaf, Inc. has announced the TPS-2000 Technical Publishing System, a graphics arts and text publishing system based on the Motorola, Inc. 68010 microprocessor. The unit was designed to run the company's software, which is said to integrate multiple-font text processing, business graphics and interactive diagramming.

The TPS-2000 supports interfaces to typesetters manufactured by Monotype, Inc., Compugraphic Corp., Autologic, Inc. and Information International, Inc. The image scanner and typesetter interface together give the TPS-2000 the ability to produce composed, typeset pages including photographs and graphics, the company said.

The price for a one-workstation configuration of the TPS-2000 is $37,500. The scanner and image editing software costs $40,000, the typesetter interfaces begin at $7,500, and prices for laser printers begin at $14,500.

Interleaf, 1100 Massachusetts Ave., Cambridge, Mass. 02138.

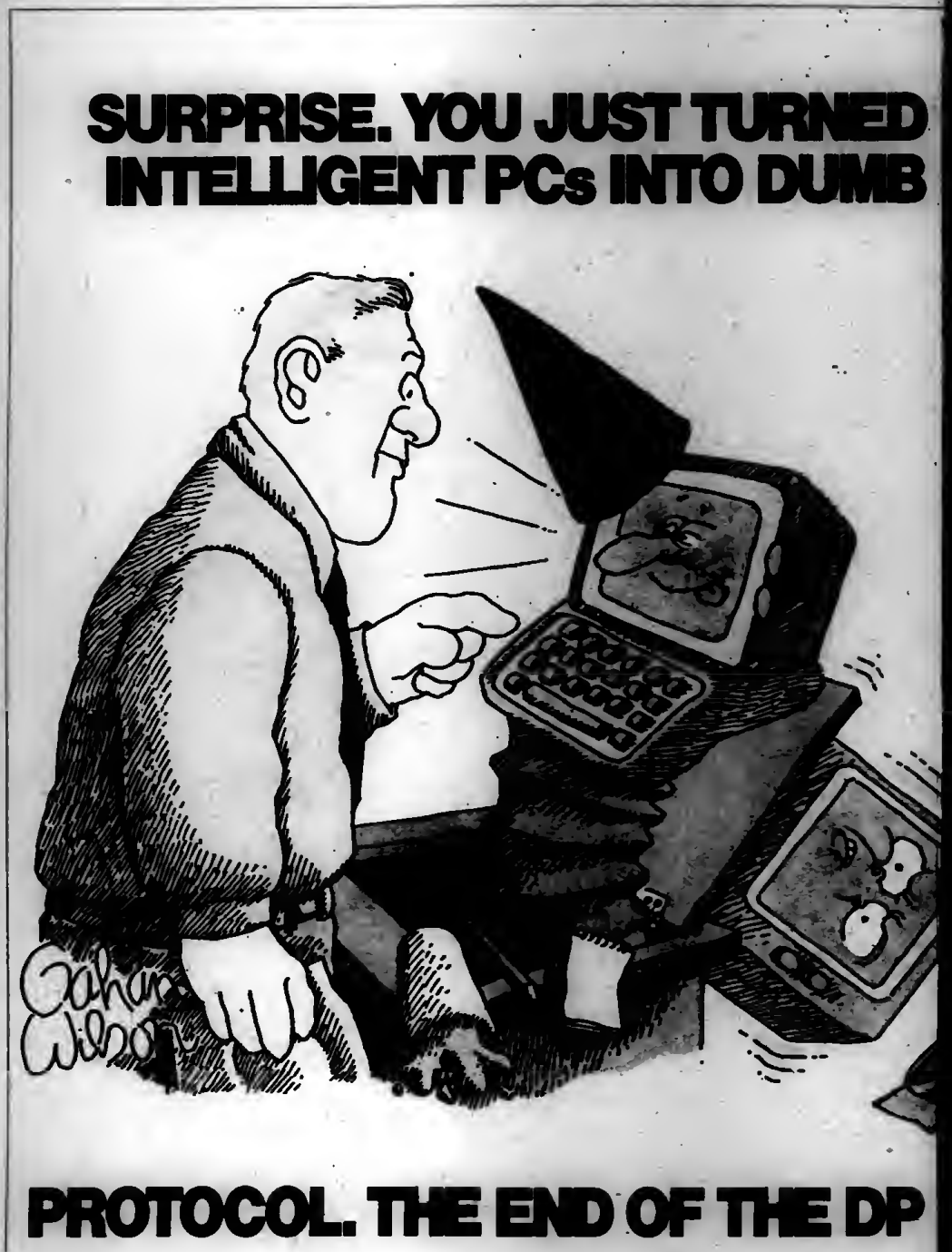
PROCESSORS

STAR TECHNOLOGIES, INC.
ST-100 for PE users

Star Technologies, Inc. has announced that its ST-100 array processor is now available to users of Perkin-Elmer Corp. superminicomputers.

The ST-100 is said to en-

Continued on page 99



Continued from page 98

able users to perform mathematical functions at up to 100M floating-point operation/sec for imaging, simulation, geophysical data processing and modeling. The ST-100 is said to free the host CPU by handling large quantities of numbers rapidly and is also said to offer high-level accessibility for the applications programmer.

The price for of ST-100 is $250,000 to $1 million, depending on the configuration, the company said.

Star Technologies, 1200 Benjamin Franklin Plaza, One S.W. Columbia, Portland, Ore. 97258.

DATA STORAGE

CHARLES RIVER DATA SYSTEMS, INC.
Disk, tape drives

Charles River Data Systems, In. has announced a 400M-byte, rack-mounted disk drive and a 9-track, ½-in. magnetic tape drive, for use with the company's Universe 68 family of computer systems.

The disk drive has an 18msec average seek time and a data transfer rate of 1.86M bit/sec. It occupies 10.5 inches of rack space and is supported by Charles River's Unos and UN/System V operating systems.

The price of the disk drive with a controller that supports three additional drives is $25,000, a spokesman for the vendor said.

The magnetic tape drive is compatible with IBM systems at 1,600 bit/in. recording density and can also be used at a density of 3,200 bit/in., the company said. The drive accepts up to 2,400-in. reels, has a streaming speed of 100 in./sec and a storage of between 60M bytes and 90M bytes.

The price of the tape drive with a controller that supports three add-on drives is $12,000, according to the vendor.

Charles River Data Systems, 983 Concord St., Framingham, Mass. 01701.

WESTERN PERIPHERALS
Tape Dimension IV Cache Coupler

Western Peripherals, a division of Wespercorp, has announced the Tape Dimension IV Cache Coupler (TD-IV), a cache buffer coupler that emulates the Digital Equipment Corp. TS11 tape subsystem.

The coupler is said to contain a 64K-byte cache buffer that stores multiple records to ensure that streaming tape devices operate efficiently on DEC PDP-11 and VAX-11 CPUs.

The TD-IV provides an interface for formatted streaming tape drives at 1,600, 3,200 or 6,250 bit/in. at speeds up to 125 in./sec. It also supports start/stop tape drives at densities of up to 6,250 bit/in. and tape speeds of 200 in./sec, the compnay said.

The TD-IV is said to install directly into any DEC Unibus small processor card slot in the CPU or expansion chassis. Cables are available for Storage Technology Corp., Computer Products, Inc. or Pertec Computer Corp. standard interfaces, the company said.

The price of the TD-IV is $1,983, the vendor said.

Western Peripherals, 14511 New Myford Road, Tustin, Calif. 92680.

TERMINALS

PSITECH, INC.
GTC 329A

Psitech, Inc. has announced the GTC 329A bit-mapped color graphics terminal, housed in a case measuring 3.5-in. high by 17-in. wide by 8.5-in. deep and based on the Motorola, Inc. 8-bit 6800 series microprocessor.

Monitors measuring 14 inches or 19 inches and with various anti-reflection and contrast enhancement features are available. Communication with the 329A is through an RS-232C port at speeds up to 19.2K bit/sec. When data is generated at the terminal for relay back to a host, a mouse or digitizer tablet is supported.

The terminal resolution is 512 by 480 pixels and 16 colors are available, the company said. Dual microprocessors provide rapid I/O and graphics primitives such as vector, circle, pie and fan.

The single-unit price of the GTC 329A with a 19-in. monitor is $5,600.

Psitech, 18368 Bandilier Circle, Fountain Valley, Calif. 92708.

See TERMINAL, page 100

ALL OF YOUR TERMINALS.

It's a classic DP nightmare.

Your company just spent a fortune to buy PCs, and put all that processing power on people's desks. Now it's your job to give those PCs access to your mainframe.

Here's where something horrible happens.

The host communications board you add converts your smart PCs into dumb 3278 terminals. Terminals that can only handle one task at a time. Terminals with none of the intelligence and processing power you paid for in the first place.

Is there no end to this nightmare?

INTRODUCING PCI-LINK.™ THE FIRST SMART WAY TO LINK AN IBM PC TO AN IBM MAINFRAME.

Relax.

Now there's PCI-Link™ from Protocol Computers. The first add-on communications board that doesn't turn a smart PC into a dumb 3278 terminal.

With PCI-Link, your PC can access an IBM mainframe, and virtually any other ASCII device—computer, microcomputer, public network or LAN—simultaneously. You can even view and compare data from different sources in up to four windows.

Result? A multi-task workstation that combines the power of IBM 3270 communications with the intelligence of the PC. Plus complete file transfer capability.

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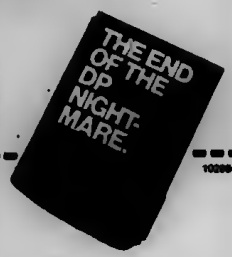

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NIGHTMARE.

IDC from page 97

teed uptime, guaranteed response time, software maintenance and remote diagnostics.

■ Users would eliminate or reduce the following options if given the choice: resident service representative and carry-in or mail-in service.

The ratings for DEC and Prime Computer, Inc. "improved significantly" over 1983, the survey stated. Manufacturers with the best overall ratings were DEC, Burroughs Corp., Hewlett-Packard and Honeywell, Inc., the report stated. Independents were ranked second overall after DEC.

Predicting more competition from independents, the survey stated, "Third-party maintenance firms cannot be overlooked any longer. Our results show a great deal of user satisfaction with independent maintenance organizations."

The service industry may be volatile for the next two years, when some shakeout of third-party firms should take place, the survey suggested.

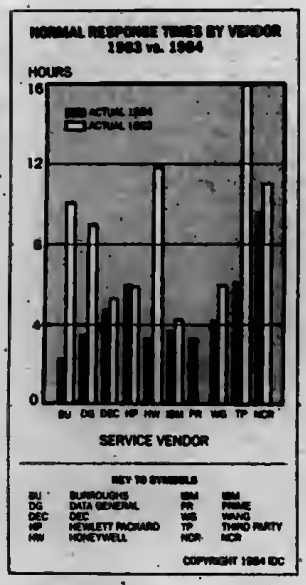
"Users are demanding a high level of service within a short period of time. Users today are more likely to seek service elsewhere because there are many viable service alternatives to choose from," the survey stated. Ron Shugan of IDC suggested that more manufacturers may get into servicing other vendors' products.

"Manufacturers are seeing new streams of service revenue," he said.

The price of the IDC report, "User Satisfaction with Customer Service Mini/Mainframe," is $1,950 prior to Oct. 31 and $2,400 thereafter, Shugan said.

More information on the customer service report is available from IDC, 5 Speen St., Framingham, Mass. 01701.

'Users are demanding a high level of service within a short period of time. Users today are more likely to seek service elsewhere because there are many viable service alternatives to choose from.'
— IDC survey.



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TERMINAL from page 99

HUMAN DESIGNED SYSTEMS, INC.
AVT-APL+; GVT-APL+

Human Designed Systems, Inc. has announced the AVT-APL+ and GVT-APL+ graphics terminals, compatible with Ansi's X3.64 standard and Digital Equipment Corp. software-compatible display terminals.

A series of display, editing and communications features has been added to the AVT+ capabilities, including switchable 80- to 132-col. format, eight pages of memory (15K bytes), 46 programmable function keys, windowing and multiple computer connections, the company said.

The GVT-APL+ models also offer software compatibility with Tektronix, Inc. 4013 terminals, the company said.

The features include 250- by 512-pixel plotting resolution and automatic scaling for business and scientific software, the company said.

The price of the AVT-APL+ with four pages of memory (7.5K bytes) is $1,595, and the price of the GVT-APL+ is $1,995, according to the company.

Human Designed Systems, 3440 Market St., Philadelphia, Pa. 19104.

MNEMOS, INC.
System 6000 workstation, printer

Enhancing its System 6000 information storage and retrieval system, Mnemos, Inc. has announced a System 6000 workstation capable of outputting both graphic images and text to the Mnemos Image printer.

A scanner unit driven by a Motorola, Inc. 68000 microprocessor has been built into the workstation. A single printer can be shared among workstations.

The System 6000 offers mass information storage and retrieval on a removable clear plastic disk that can store images from up to 6,000 8½- by 11-in. pages and up to four million characters of digital data, the company said.

The price for the workstation with a controller to drive a laser printer is

SYSTEMS & PERIPHERALS

$6,950, the company said. The price for the Maemos 6440 laser printer with a speed of 12 page/min. is $8,000, and the price of the Maemos 6400 thermal image printer with a speed of six page/min. is $3,000, the company said.

The price for creating a disk from a 5,000-page catalog would be $22,000 to $23,000.

Maemos, Suite 307, 860 Bear Tavern Road, West Trenton, N.J. 08628.

PRINTERS

INNOVATIVE ELECTRONICS, INC.
Innovator 300-LPM Printer

Innovative Electronics, Inc. has announced an extended communications interface providing its Innovator 300 LPM printer system with Burroughs Corp. compatibility.

The 300 line/min printer reportedly provides Burroughs compatibility for poll/select protocol and is available with RS-232 connection, concatenation or the Burroughs two-wire direct interface.

The printer costs $6,295, the vendor said.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

VERSATEC, INC.
Acris

Versatec, Inc. has announced communications options said to enable transmission of aperture card images to remote Versatec plotters or standard bisynchronous hosts at line speeds from 2,400 bit/sec to 19.2K bit/sec.

The Aperture Card Raster Input Scanner (Acris) digitizes silver or diazo film aperture card images for plotting on any 200 point/in. or 400 point/in. Versatec electrostatic plotter.

The options for Acris were designed to deliver full-size or scaled images to a remote site in minutes, a vendor spokesman said.

The options include disk spooling at the receiver for nonstop plotting, an added console for greater operational flexibility as well as 56K bit/sec data transfer, according to the vendor spokesman.

Scheduled to be available in early 1985, Acris with the spooling option costs $13,500, according to the spokesman.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

STRATUS from page 97

40-slot chassis option, which the vendor said increases system flexibility. The firm also announced that an entry-level FT 200 system has been enhanced to include four additional features: the Stratus Transaction Processing Facility (VOS/TPF), the Stratus Forms Management System, a text editor and any one language, the vendor said.

An entry-level FT Z40 system with 40-slot chassis, including a duplex processor module with 4M bytes of main memory, four 2M-byte memory boards, two disk controllers, cabinet, CPU memory and I/O boards, a duplex 16M-byte direct-memory access bus, duplex power supply, battery backup, two communications controllers, a communications panel and the company's VOS operating system, costs $147,300.

The cost to upgrade a 20-slot FT 200 system to a 40-slot FT 200 is $40,500. A 20-slot FT 200 can be upgraded to a 20-slot XA 400 processor for $64,000. A 20-slot FT 200 can be upgraded to a 40-slot XA 400 for $104,000; and a 20-slot FT 200 can be upgraded to a 40-slot XA 600 for $130,000.

XA 400 system

A 40-slot XA 400 system consisting of 4M bytes of main memory, duplex direct-memory access bus, duplex power supplies, battery backup, duplex CPUs, two memory controllers, four 2M-byte memory boards, two communications controllers, a communications panel and two Stratus Stratolink local-area network controllers costs $168,300.

The cost to upgrade a 20-slot XA 400 to a 40-slot model is $40,000. Upgrading a 20-slot XA 400 to a 40-slot XA 600 costs $130,000. A 40-slot XA 400 can be upgraded to a 40-slot XA 600 for $90,000, according to the vendor.

The streaming tape drive, called the Stratus 6250, can operate at either 6,250 or 1,600 bit/in. The unit can operate at up to 75 in./sec in a streaming mode and 25 in./sec in a start/stop mode. It can be used both to back up data stored on disks or to store data for tape-based applications. Data can conform to Ansi or IBM formats or be unformatted, the vendor said.

The tape drive costs $25,000, according to the vendor.

More information is available from Stratus Computer, located at 55 Fairbanks Blvd., Marlboro, Mass. 01752.

VIP from page 97

The VIP 7816 and 7826 feature a 12-in. green phosphor screen, and the VIP 7817 and 7827 display characters 56% larger on a 15-in. green phosphor screen.

The 7816 and 7817 have a high-profile-style keyboard similar to that on the 7800, and both terminals come with an RS-232C cable for connecting to a modem. The 7826 and 7827 have a low-profile keyboard and RS-422A cable for asynchronous direct connection to Honeywell CPUs.

The VIP 7816 and 7826, available in January, each cost $2,800 with a $250 annual maintenance charge. The 7817 and 7827 terminals each cost $3,350 with a $295 annual maintenance charge.

Honeywell is located at 300 Smith St., Waltham, Mass. 02154.

FUTURE from page 97

90% of the communications satellites.

For the last 30 years or so, management scientists and computer specialists have been talking a great deal about total information systems. Now the hardware to accomplish that goal is available.

Many managers, especially those in large companies, already have a desktop computer system capable of tying into a company's large computer system. Within a few years, desktop systems will become standard equipment, like the telephone on the desk or the hand-held calculator.

It also will be possible to convert stand-alone desktop computer systems into a multiuser system. Generally, this multiuser system will allow more than one user to share a CPU.

Integration of the office system with productive machinery will amount to a third industrial revolution. This revolution, in which information processing becomes part of the machine or tool, will result in knowledge-based rather than manual production.

But the system will be powerful enough so that 100 to 150 or more terminals can operate simultaneously.

In addition to the multiuser computer system will be the conversion to a distributed system, whereby three or more multiuser systems are combined. For example, a retail store chain with computer systems at each store for the cash register terminals might operate a central administrative computer system to receive nightly updates from the stores' computer systems.

The multiuser system will allow smaller organizations to develop and operate their own computer systems. In addition, it will permit more user control and decision making.

With the advent of more powerful office systems, the information manager risks being overloaded with paper and data. The critical problem will not be how to get or how to process information, but rather how to define information. This is a task that cannot be left to that mythical creature, the information specialist. Information is the manager's main tool (indeed the manager's capital) and it is he who must decide what information he needs and how to use it.

Managers will also have to come to grips with some critical questions about the role of the systems in their organizations. Who shall have access to the information obtained from the system? How can information be protected against fraud, industrial espionage, prying and gossip mongering? How can privacy be guarded? How can information be confined to those who are legitimately entitled to it, without a secretiveness that encourages scuttlebutt and demoralizes employees?

The new information technology will have the greatest impact not on human organization, but on the production process. Systems regulate the operation of machines and tools — a process already far advanced in numerically controlled machine tools, medical instruments, all kinds of testing equipment and increasingly in aircraft and automobile engines.

This integration of the office system (as one of the tools of information processing) with productive machinery will amount to a third industrial revolution. This revolution, in which information processing becomes part of the machine or tool, will result in knowledge-based rather than manual production. Within the next 15 years, the center of gravity will likely shift to technologists — people whose contributions are based more on formal schooling and theory than on apprenticeship and skill.

The office system will provide tremendous opportunities for industrial economies. But it will also impose tremendous demands on businessmen and on the economy — demands on capital equipment, on substantial shifts in productive organization and, above all, on the management of people at work.

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VENUS from page 97

improved the VAX over the years to offer more performance, it has never really revamped the processor since its introduction. The time is clearly ripe for a major VAX overhaul, especially in light of the microprocessor-based workstations that claim to offer the same performance of the VAX line, but at a fraction of the cost.

How much of the VAX DEC overhauls with the Venus project will be the most interesting aspect of the announcement. DEC, like all the other vendors, is in a difficult position: It has to perform a balancing act of developing a new technology processor that also offers sufficient compatibility with existing systems to keep current users happy. With a truly innovative successor to the VAX-11/780, DEC has a good chance of moving itself one step ahead of the competitition.

A rehashed version of the VAX, however, may leave the company in a tenuous position in an increasingly crowded marketplace.

MICROCOMPUTERS

Adapso developing micro security device

By Peter Bartolik
CW Staff

MIAMI — A subcommittee of the Association of Data Processing Service Organizations, Inc. (Adapso) is preparing written proposals for development of a microcomputer software protection device.

The subcommittee, chaired by Lotus Development Corp. Chairman Mitchell Kapor, made a preliminary presentation of the hardware-based device during Adapso's 61st management conference held here earlier this month.

Engineers at Lotus and Quadram Corp. have worked together on developing a communications protocol with which the device would communicate with microcomputers, subcommittee members said.

Mike Strickland, director of engineering at Quadram, showed photos of mock-up "cradles" or "key rings" about the size of a cigarette pack, which would attach to RS-232 ports on microcomputers and accept microchip-based "keys" that developers could require to run a software program.

Kapor said smaller developers could avoid the use of the keys and write software to interface with a master serial number in a particular key ring. The device would ensure that an individual software package could only run with a particular microcomputer, and other security procedures written into the software would prevent copying or pirating of software packages, committee members said. Strickland stated the communications protocol has been developed, is currently being tested, "and it is working."

Marv Goldschmitt, vice-president of business development at Lotus, said the committee set five goals for the device: It must be unintrusive to users, provide a new level of security, work with current and future microcomputer technologies and operating systems, provide added benefits to users and have technical specifications in the public domain.

Goldschmitt

Design goals, Goldschmitt claimed, included portability, low cost, support for hard disks and local-area networks and the ability to work in multiple program environments and with equipment without modification.

Strickland said vendors could use three levels of protection: a basic level interfacing with the serial number installed in each key ring, the key ring and a key and encryption as an advanced feature. He said the keys could be built using read-only memory chips or chips with intelligence built in for advanced communications with the computer.

Kapor noted the device would provide opportunities for third-party companies to develop security products to work with the device. Goldschmitt said users might use it to encrypt their data or to control access to corporate mainframes. Kapor added that the committee also believes more "luxurious" key rings could be developed with built-in printer caches or modems.

Kapor said he did not know if the device would evolve into an industry standard, but he added that participants in the project will independently develop a device if vendors fail to adopt the standard.

Lotus' chairman claimed the committee has set a goal of making the devices available to users at a cost of $25. To be persuaded to adopt the device, software ven-

See PROTECT page 120

■ AT&T has introduced three graphics products for its Personal Computer 6300 and compatibles/104

■ Cubicomp Corp. has enhanced its Polycard/10 graphics package/104

■ IBM has added two letter-quality printers to its Personal Computer line/106

INSIDE

Software/106
Systems/112
Communications/112

Information Technologies releases series of communications products

SCOTTSDALE, Ariz. — Information Technologies, Inc. has introduced Linkup, a family of micro-to-micro and micro-to-mainframe data communications products, including intelligent plug-in communications adapter boards and related software for IBM Personal Computers, Personal Computer XTs and compatible machines.

According to Thomas H. Hesse, executive vice-president of the company, which was founded in 1982, the firm's products will help data processing departments overcome the "communications tangle" presented by an installed base of personal computers, workstation terminals and mainframes that require different protocols to communicate with each other.

Unlike many communications boards that support only one protocol, Information Technologies' boards support a variety of protocols, Hesse said.

At the heart of the Linkup system is the Linkup 1, a programmable communications coprocessor adapter board, which includes an advanced protocol controller, a high-performance processor and up to 36K bytes of random-access memory. The Linkup 1 board can connect an IBM Personal Computer to networks using synchronous or asynchronous protocols over leased or switched lines, the firm said.

In asynchronous transmission, the Linkup 1 board is said to have a line-speed capability of 37.5K to 19.2K bit/sec. Its synchronous line-speed capability is said to be 800K to 64K bit/sec.

The Linkup 1 is used with the Linkup family of terminal emulation software, which includes the following: Asynchronous Terminal

See LINKUP page 120

Harvard unveils second project management tool

LITTLETON, Mass. — Harvard Software, Inc. has added a second project management system, Total Project Manager, to its product line.

The product designed for the IBM Personal Computer, is said to offer resource management features that enable managers to oversee complicated interrelationships between a number of tasks, to manage resources and to control costs, Harvard said.

Total Project Manager reportedly allows a user to allocate and track a resource used in more than one project. With the product, a user can, at any time, measure the progress of a project

See HARVARD page 120

Statistical packages often provide better tools than spreadsheets

MICRO BITS
Thomas Madron

Since the introduction of Software Arts, Inc.'s Visicalc, interest in computational software has focused on spreadsheet programs, even when other software might have been more appropriate. Magazine articles and advertisements still give the false impression that spreadsheets are the only way to use a microcomputer for arithmetic calculations.

Madron is manager of computer services, North Texas State University, Denton, Texas.

The spreadsheet's ease of use for simple calculations has ensured its popularity, but spreadsheets are very difficult to use for calculations more complex than row and column totals or subtotals.

Templates — a set of spreadsheet formulas predesigned to do complex problems — ease this problem. Even menu-driven templates do not provide the user with the statistical techniques often needed for detailed and accurate forecasting, such as regression and time series analyses.

Although people have been writing microcomputer statistical programs for a long time, comprehensive statistical packages have not been widely available. Recently, microcomputer statistical packages with mainframe power have begun to emerge.

Like their spreadsheet cousins, statistical packages generally operate on a rectangular data matrix composed of rows and columns. The rows usually represent records or observations while the columns are fields or variables. The difference between statistical packages and spreadsheets is that statistical packages provide formulas necessary to do a calculation, while an end user provides the formulas with a spreadsheet.

Many statistical systems also offer extensive data management capabilities designed to let the user recode (reclassify) or transform the data as needed. Such features provide the user with analytical tools far exceeding the capacity of spreadsheet programs.

For years, mainframe statistical packages have been available; among the more popular programs are SPSS, Inc.'s SPSS, SAS Institute,

See STATISTIC page 120

Cubicomp graphics aid enhanced

BERKELEY, Calif. — Cubicomp Corp. has enhanced and added optional extensions to Polycad/10 (formerly CS-5), a solid modeling graphics package that runs on an IBM Personal Computer.

The package reportedly allows a user to design three-dimensional, shaded-surface, full-color models. Using 300 commands, the user can rotate, scale, duplicate and combine models; alter the direction of a light source; and choose between orthogonal and perspective projections, according to the vendor. Jagged lines can be smoothed through antialiasing, and up to 4,096 colors from a palette of 16.8 million colors can be blended for various shaded effects, Cubicomp said.

The enhancements include new algorithms that speed the product's execution, the firm said. Another enhancement reportedly allows users to record animated sequences automatically rather than requiring frame-by-frame supervision of the process. With contact closure relays attached to the Personal Computer's motherboard, cameras and video recorders can be placed under software control, according to the vendor.

Four extensions are available: Boolean construction operations, an interface to digital film recorders, typographical extensions and a callable subrouting library.

Boolean construction operations permit the merging of two images through their union, intersection and difference. The cost is $1,900.

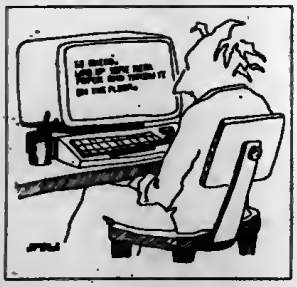
Digital film recorder interface transmits three-dimensional images to the Matrix Instruments, Inc. Quick Reaction Communications camera, which creates images with 4,000- by 3,700-pixel resolution. The cost of the digital film recorder interface is $2,900.

The typography extension, priced at $900, is said to permit users to design and archive fonts, type them directly onto a screen and position them for presentation-quality images.

The subroutine library, priced at $1,900, reportedly consists of Cubicomp software reformatted as linkable object code libraries written in C.

Polycad/10 consists of software, a frame buffer and an interface card and costs $11,900. Polycad/10V, which includes a board for recording output onto a video tape recorder, is priced at $13,900.

Cubicomp is located at 3165 Adeline St., Berkeley, Calif. 94703.



AT&T offers micro graphics products

Trio comprises imaging board, graphics board, micro decoder

NEW YORK — AT&T has introduced three graphics products for the AT&T Personal Computer 6300 and compatible microcomputers, including the IBM Personal Computer line.

Among the new products is a Video Display Adapter, a high-resolution graphics board that is said to enable the micros to display continuous-tone, television-quality images on color TVs or video monitors, including red-green-blue (RGB) analog monitors.

Also introduced was the Image Capture Board, an imaging board that can capture television-quality images from such video sources as home video cameras, according to the vendor.

Rounding out the offering was a software package called the Personal Computer North American Presentation-Level Protocol Syntax (NAPLPS) Decoder. The NAPLPS decoder comes bundled with a Video Display Adapter and allows it to receive and display frames encoded in NAPLPS and to provide the same color videotex quality as the AT&T Sceptre videotex terminal, according to the vendor.

The Video Display Adapter is said to offer high spatial resolution using a built-in mode for that function and possesses the ability to pass data from a standard color graphics adapter to a RGB monitor while allowing an 80-col. display. It reportedly comes bundled with a diskette of software tools and a library of fonts, geometrics and images.

The products are priced as follows: Video Display Adapter, $695; Image Capture Board, $1,295; NAPLPS Decoder with Video Display Adapter, $850.

Additional details are available from AT&T Consumer Products, 5 Wood Hollow Road, Parsippany, N.J. 07054.

Toward Clearer Communications:

InteCom discus

Audit service aids control of illegal micro software

STERLING HEIGHTS, Mich.— D.L. Hiller & Associates, Inc. has announced an auditing service to help large organizations control illegal microcomputer software use.

Auditors with certificates in information systems auditing are said to examine both hard and floppy disk systems on a random basis to ferret out illegal software. The software is then either removed or supported with legally purchased manuals and disks, the company said.

The auditors also screen company data left on hard disks and report on adherence to local company standards, according to the vendor. The examiners reportedly recognize poor data control practices and recommend improvements. Personal Computer Audit & Review (PCAR) is said to provide an inventory of the organization's hardware and software.

The vendor recommended that the PCAR service be conducted annually to insure proper corporate information management practices.

The cost of the auditing service is $75 per hour plus expenses.

More information is available from D.L. Hiller & Associates, 14536 Island Drive, Sterling Heights, Mich. 48078.

IBM printers released

Quietwriter, Wheelprinter for IBM micro

RYE BROOK, N.Y. — IBM has released two letter-quality printers for the IBM Personal Computer line: Quietwriter and Wheelprinter.

Quietwriter operates at speeds of 40 char./sec in 10-pitch mode, 48 char./sec in 12-pitch mode, 60 char./sec in 15-pitch mode and 40 to 60 char./sec in proportional spacing mode, according to the vendor.

It reportedly features semiautomatic cut-sheet feed, a Centronics-type parallel interface and printing with a 53-db noise level.

Quietwriter also includes two on-line font cartridges — one for traditional text processing and a 252-character font in the IBM Personal Computer character set for graphics output, according to the vendor.

Wheelprinter is said to print at 12 char./sec in 12-pitch mode and supports proportional spacing, 10-pitch and 15-pitch modes.

Wheelprinter also features bidirectional printing in any mode, and the printer includes nine Ascii printwheels and a Centronics-type parallel interface, IBM said.

The price of Quietwriter is $1,395, and the price for Wheelprinter is $1,795.

IBM is located at 900 King St., Rye Brook, N.Y. 10573.

ses voice/data integration.

The manufacturer of the first integrated voice/data switching system considers the issues.

Data is a major factor in office communications today. It's projected that within the next five years, data transmission will increase from the present 2% to 40% of total PBX traffic. That's explosive growth. And it means that companies must accommodate this increase by expanding their present systems or by planning now to replace obsolete systems with ones that can meet those needs.

A look at alternatives.

To keep pace with this change, an organization has two basic choices. First, it can stay with a limited voice-only PBX and create separate data networks. This, however, is a costly, inefficient method, and it becomes increasingly difficult to manage multiple expanding systems.

The second alternative is an integrated voice/data system. By installing one network, a company can have voice and data capabilities at every outlet.

Key benefits are the sharing of resources — devices and software — and consolidated network management. An integrated system is an investment in the future that can pay for itself in the savings of single network administration.

A definition of terms.

Integrated voice/data is sometimes thought of as simply combining voice and data in one switch. But it's really much more. It's the total integration of voice and data through a twisted pair network.

Because a digital system does not distinguish between voice and data, both look the same as they pass through the switch. So it's possible to apply sophisticated voice features to data — least cost routing, conference calls between workstations, callbacks on data terminals and other aids to productivity that are normally associated with voice-only systems.

Major considerations.

Universal Connectivity

One of the greatest challenges facing communications professionals today is the management of changing technology. In an environment where many approaches to office communications call for complete flexibility, only a system designed to be compatible with multi-vendor equipment is a safe choice. Such a system provides the format and protocol conversion capabilities for dissimilar devices to communicate with each other, freeing a company from the need to choose all its equipment from one vendor.

A system should be capable of connecting numerous dissimilar devices to a common network, allowing them to share peripherals, data and functions. This flexible connectivity also protects your investment in equipment, ensuring its continuing value.

Non-Blocking Traffic

In voice systems, many calls can share one path through the switch because conversations are short and not everyone uses his telephone at the same time. However in data communications each device needs full access through the switch, and the long holding times of data calls place heavy demands on a network. As more data circuits are added to meet growing user needs, a system founded on voice-only design can't handle the traffic and begins to block calls from completion, or to degrade the quality of transmission.

Non-blocking matrix architecture, however, places no restrictions on voice and data access. As the data-to-voice proportions change, the system is reconfigured at the host controller. And there's no new cabling required. In non-blocking systems, savings are soon realized in simplified administration.

Processing Capacity and Speed

Many installed systems operate on 16-bit processors. While this may be adequate power for today's voice-only systems with few data options, it may not be sufficient for tomorrow.

Since a system's processors are the limiting factor, they must offer enough capacity for growth. A system offering 32-bit processors can handle both present and future capacity requirements. It's valuable insurance against obsolescence, with unlimited potential for applications like video and future developments.

The office automation industry is introducing more and more devices that operate at speeds up to 10 Mbps. Only an integrated voice/data system that offers 10 Mbps connectivity and integrated local area networking can successfully carry a company into the automated office environment now evolving.

A view for the future.

In 1979 InteCom introduced the first integrated voice/data system, the IBX™ Integrated Business Exchange, and since then has been setting the pace for the office communications industry.

The system has been proving its merits in installations all across the country for more than three years. It's backed by comprehensive support and refined through an ongoing program of research and development. Software-oriented, adaptive to new technology and protected from obsolescence, the IBX offers you the connectivity needed for tomorrow's automated office.

We hope this look at the issues of voice/data integration will be useful to you in your system selection. InteCom has met the communications requirements of companies in a wide range of industries. And today, our representatives are ready to help you evaluate your specialized needs.

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SOFTWARE

ATRON CORP.
Software Probe, Software Source Probe

Atron Corp. has introduced a version of its software debugging tools, Software Probe and Software Source Probe, for the IBM Personal Computer AT.

The debugging tools reportedly allow programmers to complete single-step, trace, breakpoint functions and perform symbolic or source-level debugging of programs for the AT. They also are said to be compatible with the C, Pascal, Fortran and assembler languages.

Each debugging tool features a mouse-like switch box that can be plugged into the AT to allow programmers to return to the debugger and determine the cause of a bug when a program crashes, according to the vendor. The new debugging tools reportedly were designed to work with the AT's dual interrupt controller and Intel Corp. 80286 microprocessor instruction set.

Software Probe is priced at $295. Software Source Probe costs $695.

Atron, 20665 Fourth St., Saratoga, Calif. 95070.

PRECISION SOFTWARE INC.
Unicentre Series

Precision Software, Inc. has introduced a line of integrated, AT&T Unix-based business applications modules, Unicentre Series, for the Burroughs Corp. XE-550 supermicrocomputer.

The series includes seven modules: Accounts Payable, Accounts Receivable, General Ledger, Inventory Management, Order Processing, Payroll and Purchasing Management. Also available is a utility program called The Shuttle that reportedly uses Unix features to speed file transfers to and from Burroughs mainframes.

The software is written in Ryan-McFarland Corp. R-M Cobol and operates under the Unix System V operating system, provided with the Burroughs XE-550, according to the vendor. The average price of each module is $1,500. The Shuttle is priced at $5,000 for the Burroughs B1000 series interface and at $10,000 for the interface for the Burroughs B2000 through B7000 models.

Precision Software, 78 E. Little Canada Road, St. Paul, Minn. 55117.

See TOOLS page 106

TOOLS from page 105

NANTUCKET, INC.
Clipper

Nantucket, Inc. has introduced Clipper, a compiler for programs written for Ashton-Tate's Dbase III relational data base software.

Clipper, for the IBM Personal Computer, reportedly makes more efficient use of disk storage by creating application code files that are more compact than interpretive versions created under Dbase III.

Clipper also generates relocatable executable elements that cannot be backtracked to source code, freeing programmers from data encryption, Nantucket said. Since compiled versions of Dbase III applications provide an alternative to using runtime modules, they reportedly avoid runtime license fees that would otherwise be included in an application's price.

Clipper is priced at $695, the vendor said.

Nantucket, 20456 Pacific Coast Highway, Malibu, Calif. 90265.

DATA GENERAL CORP.
Autocad for Data General/One

Data General Corp. has announced that it will distribute Autodesk, Inc.'s Autocad computer-aided design (CAD) software for the Data General/One, a lap-size, 16-bit personal computer that runs Microsoft Corp.'s MS-DOS operating system.

The software would reportedly permit the DG/One to function as a portable CAD workstation. Autocad CAD software is said to be a two-dimensional drawing package for engineers, designers and drafters.

The DG/One, introduced in September, reportedly weighs 9½ lb, has an 80-char. screen, a typewriter-style keyboard and one or two disk drives.

Autocad CAD for the DG/One is priced at $2,000, according to the vendor.

Data General, 4400 Computer Drive, Westboro, Mass. 01580.

AMERICAN BUSINESS COMPUTER
Workstation Basic

American Business Computer has introduced Workstation Basic, a Basic programming environment for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.

Workstation Basic reportedly consists of an interactive Basic compiler/interpreter, a command processor and several utility programs, including sort, presort and index. It is also said to be compatible with Basic on the IBM System/23, 36, 38 and 4300 series.

The product's other features are said to include indexed disk files, definition of multiline functions in a program and trace and stepped-execution facilities.

Workstation Basic is priced at $695. A runtime version is available for $450, according to the vendor spokesman.

American Business Computer, 1600 W. Nine Mile Road, Southfield, Mich. 48075.

AUTOMATIC FORECASTING SYSTEMS, INC.
Micro versions of Autobj, Autobox, Box, Simulator

Automatic Forecasting Systems, Inc. has introduced microcomputer versions of several of its mainframe forecasting packages: Autobj, Autobox, Box and Simulator.

The software, for an IBM Personal Computer with 256K-bytes of internal memory and two diskette drives, reportedly allows users to build univariate and multivariate Box-Jenkins models, including intervention models.

Users are also able to identify, estimate and forecast without using the product's automatic features, according to the vendor.

All of the modeling packages except Autobj are priced at $195 each. Autobj is priced at $595, a spokesman said.

Automatic Forecasting Systems, P.O. Box 563, Hatboro, Pa. 19040.

PHOENIX COMPUTER PRODUCTS CORP.
Pfix86; Pfix86 Plus

Phoenix Computer Products Corp. has introduced its Pfix86 and Pfix86 Plus debuggers for use with the Intel Corp. 8088/8086 family of microprocessors under IBM's PC-DOS and Microsoft Corp.'s MS-DOS.

Pfix86 is said to be designed for use with assembly or high-level programming languages in the MS-DOS environment and to feature multiwindow display for simultaneous viewing of program code, data, breakpoint settings, current machine register and stack contents.

Pfix86 Plus offers symbolic debugging of overlayed programs and requires the Plink86 linkage editor to execute symbolic debugging of overlayed programs, according to the vendor.

Pfix86 is priced at $195, Pfix86 Plus at $395 and Plink86 at $395, a spokesman said.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

VIANETIX
Vianet

Vianetix has introduced local-area network software that reportedly links personal computers with Microsoft Corp.'s MS-DOS, IBM's PC-DOS and AT&T's Unix operating systems.

Vianet reportedly offers a distributed architecture, applications software compatibility and hardware independence. Its distributed

Continued on page 108

"How I was freed from solitary confinement by a floppy disk."

Introducing the PC7800 Micro to Mainframe link from Honeywell.

The PC7800 software package transforms many personal computers running on MS-DOS* into Honeywell professional workstations. Now users who have been isolated can communicate directly with a large Honeywell GCOS mainframe.

Being able to utilize the power and performance of the mainframe not only makes users less lonely, it can make them a lot more productive. They can take advantage of the wide range of Solution Center productivity software to perform their own information processing.

This can go a long way towards reducing the applications development backlog in the data processing department. And because PC7800 allows users to draw from a shared database, corporate-wide data can become more consistent and up-to-date.

So why not turn these personal computers into powerful Honeywell professional workstations? To get your PC7800 software package, just ask your DP manager to order it on his Honeywell HIS 439A order form. If he doesn't have this form, call toll-free 800-328-5111, extension 2727. In Minnesota, call collect 1-612-870-2142, extension 2727.

Another Big Idea from Honeywell Large Systems.

Look to Honeywell Large Systems for solutions to information management problems and for products ranging from powerful computers to comprehensive networking capabilities.

Together, we can find the answers.

Honeywell

*MS-DOS is a trademark of MicroSoft Corporation.

Continued from page 106

processing capacity sidesteps single-point failures and eliminates the queuing problems of central server-based architectures, a vendor spokesman said.

Vianet is not tied to specific machine architecture or local-area network transmission hardware or protocol, according to the Vianetix spokesman.

Vianet is priced at $125 per node, the vendor said.

Vianetix, 5766 Central Ave., Boulder, Colo. 80301.

BLAISE COMPUTING, INC.
Sparky

Blaise Computing, Inc. has introduced Sparky, a memory-resident, scientific programmable calculator for users of the IBM Personal Computer with IBM's PC-DOS operating system.

Sparky is said to have its own programming language and to be able to read and write files or data.

It accepts base two to base 35 numbers as input and generates output in standard real, scientific real and hexadecimal, octal or binary format, the vendor said.

The product reportedly works with either a monochrome or color monitor.

Sparky is priced at $75, according to the vendor.

Blaise Computing, 2034 Blake St., Berkeley, Calif. 94704

DICOMED CORP.
Presenter PC

Dicomed Corp. has introduced Presenter PC, a graphics software package for the IBM Personal Computer, capable of producing presentation-quality slides and overheads with a resolution of up to 8,000 pixels.

The Presenter PC program is said to have the capability to take Data Interchange Format files from a variety of data base and spreadsheet programs and generate charts and graphs. Other features reportedly include 64 on-screen colors; a range of graphics tools, including two graphics-arts-quality fonts, lines, circles, rectangles and triangles; and real-time manipulation of those graphics.

The vendor said the menu-driven program includes a single-line Help feature, which is displayed at all times with a full page of documentation available for an active function. Presenter PC works with the keyboard, mouse or digitizing tablet.

The package is priced at $995, the vendor said.

Dicomed, 12000 Portland Ave. S., Minneapolis, Minn. 55400.

EYRING RESEARCH INSTITUTE, INC., ABSOFT CORP.
Fortran 77 compiler for Pdos

Eyring Research Institute, Inc. and Absoft Corp. of Royal Oak, Mich., have announced that Absoft's Fortran 77 compiler runs under Eyring's Motorola, Inc. 68000-based Pdos real-time, multitasking operating system.

Absoft Fortran 77 is an implementation of Ansi Fortran 77. The compiler sets no limit on program or data size and generates position independent re-entrant codes, according to the vendor.

The product reportedly supports six standard data types: character, logical, integer, real, double precision and complex. Absoft Fortran 77 is said to come with a screen-oriented, source-level debugger and a program execution profiler.

The Fortran compiler is available for $950.

Eyring Research Institute, 1455 W. Rt. 820 N., Provo, Utah 84601.

EYRING RESEARCH INSTITUTE, INC.
Pdos C

Eyring Research Institute, Inc. has announced that it has ported C68, a C compiler from Alcyon Corp. of San Diego, to run under Eyring's Pdos operating system.

The compiler, written in C, reportedly provides direct access to more than 100 Pdos system calls. The run-time library source will be included with the compiler, according to Eyring.

Pdos C is said to support a subset of AT&T's Unix I/O library to give users portability from Unix, Unix look-alikes and other operating systems using C.

Pdos C costs $750, according to the vendor.

Eyring Research Institute, 1455 W. Route 820 North, Provo, Utah 84601.

SUMMIT SOFTWARE TECHNOLOGY, INC.
Betterbasic

Summit Software Technology, Inc. has announced a Basic programming software program for use with the IBM Personal Computer.

Called Betterbasic, the program is an implementation of the Basic language with a syntax said to be modeled after Microsoft Corp.'s Basic. The program also incorporates some of the features of the Pascal, Modula 2 and C languages, according to the vendor.

Other features include high-speed execution, support for large memories, variable precision decimal math and optional Motorola, Inc. 8087 co-processor support, the vendor spokesman said.

The package supports program block structures, record and pointer data types, procedure and functions, local and global variables, recursion, separately compiled library modules and language extensibility, according to the vendor.

Betterbasic costs $199, the vendor said.

Summit Software Technology, 40 Grove St., Wellesley, Mass. 02181.

See TOOLS page 112

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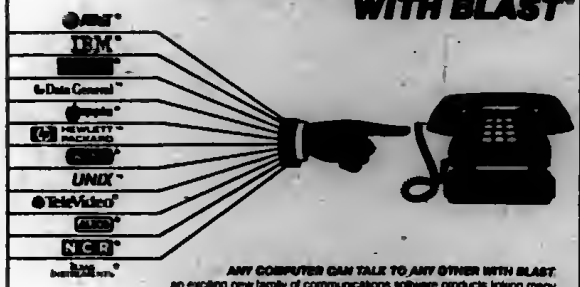
REACH OUT AND TOUCH THEM ALL WITH BLAST®



ANY COMPUTER CAN TALK TO ANY OTHER WITH BLAST, an exciting new family of communications software products linking many different computers and operating systems for fast, error-free file transfers via dial-up phones. Micros, minis, and mainframes become compatible despite diskette and data format differences.

NO EXPENSIVE ADD-ON BOARDS NEEDED BLAST software uses standard RS 232 ports and low-cost asynchronous modems (300, 1200, 2400, 4800 baud) or direct-connect at speeds up to 19,200 baud.

SUPPORT REMOTE SITES sending programs, patches, updates by phone, even to unattended sites. BINARY FILES, TEXT, OR COMMANDS can all be transferred error-free among many different systems. Transmit spreadsheets, reports, electronic mail, word processing files, among many systems. BLAST automatically converts text file formats.

FULL DUPLEX, SLIDING-WINDOW PROTOCOL speeds data thru the noisiest phone lines, thru satellite-routed phone links, over packet switched networks, or over local area networks.

LOW-COST, LONG-RANGE COMPATIBILITY is here, whether you need to link two systems or two thousand, at prices from $250 per site (volume discounts/OEM pricing available). Or, BLAST may be licensed for building communications into your custom applications software.

BLAST is available for 65 major computers including the following:

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GO FOR THE BEST, REGARDLESS OF COST EVEN IF IT'S CHEAPER.

There are some people who wouldn't buy a Rolls Royce for a buck-ninety-five if it didn't come with a hood ornament.

Mercifully, there are other people: those who purchase things (like computers) because of logic, rather than insecurity.

For those, we offer this chart showing how the Leading Edge Personal Color FXD Computer differs from the IBM® XT, not a self-serving litany of trivial distinctions, but a straight-up comparison of basic things of righteous concern.

After you read it, bear in mind that any consequent action you take requires only admirable lack of cowardice.

	THE LEADING EDGE™ PERSONAL COLOR FXD	THE IBM XT WITH COLOR OPTION
Display	Full color display standard	Color monitor—$680. Color controller—$244.
Memory	256K Standard	256K Standard
Speed	7.16 MHz and 4.77 MHz Standard	4.77 MHz Only
Expandability	Expandable to 640K No additional boards	Expandable to 640K Must add two boards
Graphics	Capability Standard	With Color Monitor and Color graphic board
Ports	Both Parallel and Serial Standard	Serial Standard, Parallel optional–$75.
Expansion Slots	7 slots Standard of which 3 remain open after expansion to 640K	8 slots Standard of which 1 remains open after expansion to 640K
Warranty	One Full Year parts and labor	90 Days parts and labor
Support	Lifetime no charge toll-free hotline Standard. The best in the industry	None on hardware, software optional at $40 per call.
Service	Nationwide Service Centers	Nationwide Service Centers
Price*	$3,495 Complete (Standard 10 MB Hard Disk Configuration)	$5,459 Configured as 10 MB Hard Disk

*as of 10-4-84

LEADING EDGE COLOR PC: THE GREAT UNKNOWN

LEADING EDGE PRODUCTS, INC
LEADING EDGE PC AND SYSTEMS DIVISION, 225 TURNPIKE STREET, CANTON, MA 02021. 800-343-6833 (617) 828-8150.
FORTUNE DIVISION, 225 TURNPIKE STREET, CANTON, MA 02021 800-354-0554 (617) 828-8150.
SOFTWARE DIVISION, 21 HIGHLAND CIRCLE, NEEDHAM, MA 02194 800-343-3436. (617) 449-4655.

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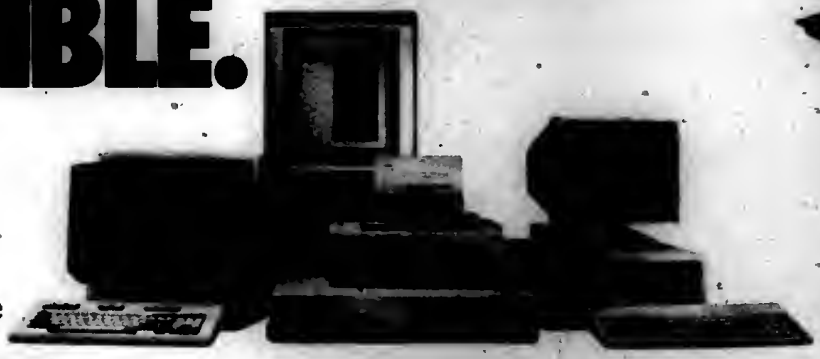
THE NEW COMPUTERS FROM AT&T. FLEXIBLE. RELIABLE. AND VERY COMPATIBLE.

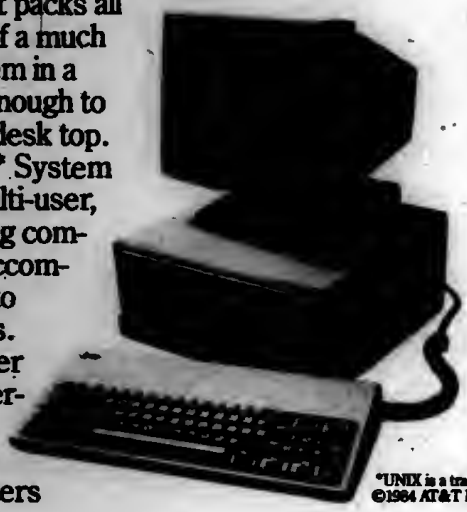


They're new in every sense of the word. New in conception, new in design, new in their ability to deliver unprecedented levels of computer performance. After over 40 years of designing and manufacturing computers, AT&T is proud to introduce a whole new line of innovative computers for business...AT&T Computers.

MEET THE FAMILY

The 3B2, 3B5, and the AT&T Personal Computer make up the new AT&T family of flexible business computers.

The AT&T 3B2 is one of the most advanced super microcomputers you can buy today. It packs all the power of a much larger system in a size small enough to sit on your desk top. This UNIX* System V based multi-user, multi-tasking computer can accommodate up to 18 terminals.



For larger family gatherings, the AT&T 3B5 minicomputers make great hosts, because they can accommodate up to 60 users.

And meet the new AT&T Personal Computer. What makes it special is its ability to combine high performance with excellent

UNIX

graphics capabilities, an adjustable display monitor, and non-glare screen. Its flexibility allows it to operate as a stand-alone unit or as part of an integrated computer network. And its compatibility allows it to run most popular business software, including most available MS-DOS** applications.

THE FAMILY THAT WORKS TOGETHER

One big advantage of AT&T Computers is that when there's work to be done, everyone pitches in.

Each family member works together in a coordinated system, making tasks easier

*UNIX is a trademark of AT&T Bell Laboratories. **MS-DOS is a trademark of Microsoft Corporation.
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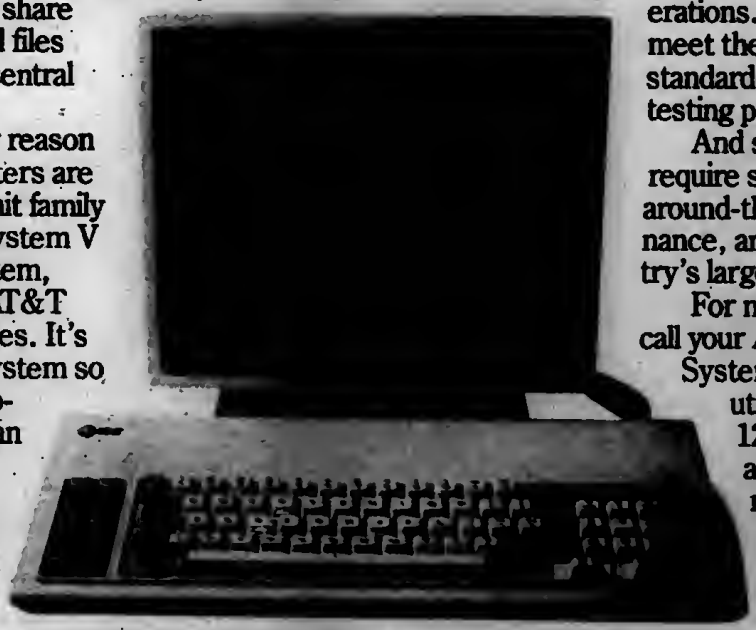
and users more productive. All AT&T Computers are based on our Information Systems Architecture, an open, communications-based structure that can accommodate and integrate not only our products, but also those of other manufacturers.

Another reason AT&T family members work so well together is our unique PC Interface. It bridges the MS-DOS and UNIX Operating Systems, allowing you to use your PC as part of a larger 3B network. Several PC users can thus share peripherals and files stored on the central 3B2 machine.

Yet another reason AT&T Computers are such a close-knit family is our UNIX System V Operating System, developed by AT&T Bell Laboratories. It's an operating system so flexible, it's rapidly becoming an industry standard. And because UNIX software is upwardly compatible, 3B2 software can run on 3B5 computers, thus protecting your investment and eliminating costly and time-consuming retraining.



THEY GET ALONG FAMOUSLY WITH MOST EVERYONE

AT&T Computers get along so well with each other, they can't help but get along with just about everyone else. The AT&T Information Systems Network links AT&T Computers with those of other manufacturers. It's a flexible, cost-efficient link between terminals, workstations, and computers of all sizes. This local area network allows you to connect departments, buildings, industrial parks, or even campuses. And gives you fast response time and centralized administration and control.

Regardless of the equipment you might own or acquire, with AT&T Computers it will be like one big happy family.

BUILT-IN RELIABILITY AND SERVICE

Judging by the way they're made and cared for, this family will be around for generations. AT&T Computers meet the toughest design standards and most rigorous testing procedures.

And should you ever require service, we offer around-the-clock maintenance, and one of the industry's largest service forces.

For more information call your AT&T Information Systems Account Executive or 1 (800) 247-1212. Then make arrangements to meet the family: the 3B2, 3B5 and the AT&T Personal Computer. When it comes to meeting your needs, AT&T Computers couldn't be more compatible.

AT&T INFORMATION SYSTEMS. WHEN YOU'VE GOT TO BE RIGHT.

AT&T

MICROCOMPUTERS

TOOLS from page 108

LATTICE, INC.
DBC Library

Lattice, Inc. has introduced its DBC Library, a software tool kit that reportedly allows programs written in the C language to access Ashton-Tate's Dbase II and Dbase III files under Microsoft Corp.'s MD-DOS, IBM's PC-DOS and AT&T's Unix.

The DBC Library can be used as an indexed file system or in conjunction with Ashton-Tate's Dbase products.

The DBC Library reportedly can be used to extend Dbase applications or to write new applications and does not require a copy of Dbase for use.

DBC Library costs $250. The Library plus source code costs $500.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

FOX & GELLER, INC.
Quickreport

Fox & Geller, Inc. has introduced Quickreport, a report generator for IBM Personal Computers running Ashton-Tate's Dbase III.

Quickreport is said to require no programming and combine up to five Dbase III data bases into one report, which reportedly can include a variety of calculations on data. Users can perform group breaks on up to 16 different fields and select data according to their criteria, the vendor said. A high-speed sort facility is said to be built-in.

Quickreport requires 256K bytes of memory and is priced at $295.

Fox & Geller, 604 Market St., Elmwood Park, N.J. 07407.

Infotym
Promptdoc

Infotym, a division of McDonnell Douglas Corp., has introduced Promptdoc, a software tool for writing software manuals.

Promptdoc, for the IBM Personal Computer, reportedly consists of a framework for writing as many as nine different instruction manual chapters.

Chapter models may be custom-designed by users. Each manual may contain up to 12 chapters.

Promptdoc also is said to supply standard text for introductions and transitions to new subjects. Guidelines for writing software documentation are included in its reference.

Promptdoc is priced at $650.

Infotym, 20705 Valley Green Drive, Cupertino, Calif. 95014.

I.P. SHARP ASSOCIATES, LTD.
Sharp APL/PCX

I.P. Sharp Associates, Ltd. has introduced Sharp APL/PCX communications software for the IBM Personal Computer XT/370.

Sharp APL/PCX reportedly offers micro-mainframe compatibility and operates directly under IBM's PC-DOS. It is said to include the Sharp APL interpreter, a session manager, a file system, a shared variable processor, three auxiliary processors and utility software.

Each copy of Sharp APL/PCX also is said to include two system diskettes, a pocket reference, APL stickers for the computer's keyboard and the ability to allow the computer to display APL characters.

Sharp APL/PCX costs $2,500.

I.P. Sharp Associates, Suite 1900, 2 First Canadian Place, Toronto, Ont. M5X 1E3.

In automating an office, one must often choose between piece and harmony.

Most companies approach office automation piecemeal. So it's not surprising when their wordprocessors can't talk to their microcomputers. And mainframe text editing is frequently inaccessible to the personnel who need it most. It's also why Boeing Computer Services now introduces Boeing Office Solutions.

Boeing can integrate your current office automation hardware, regardless of brand. And we can help you choose future pieces or total systems — *without bias to a particular hardware manufacturer.*

In other words, you can come to us at any stage in the office automation process with the knowledge that we'll help you achieve harmony of hardware, software and communications.

We also offer you special software systems that can make your operations more productive . . . immediately.

For example, there's PROFS*, a system that can keep your calendar and send memos. Or DISOSS*, documentation library and distribution services. Or the Boeing Document Transfer System, a system that transforms and transmits editable text documents between your word processing machines.

PROFS, DISOSS and the Boeing Document Transfer System all run on our MAINSTREAM® teleprocessing system. Or you can license the Boeing Document Transfer System for your own computers.

Boeing Office Solutions are just one part of Boeing's complete integrated information services. Including enhanced remote computing services. Distributed processing and micro/mainframe links. Additional software solutions. Education and training. And a variety of professional support services.

For more information or the location of the sales office nearest you, call toll free 1-800-447-4700. Or write BOEING COMPUTER SERVICES, M.S. CV-26-16B, 7980 Gallows Court, Vienna, Virginia 22180.

BOEING COMPUTER SERVICES A Division of The Boeing Company

*Trademark of International Business Machines Corporation. MAINSTREAM is a registered service mark of The Boeing Company.

SYSTEMS

FORTUNE SYSTEMS CORP.
32:16 enhancements

Fortune Systems Corp. has enhanced and reduced the price of its Professional System (PS) series and has added another model to the Expanded Performance (XP) series of Fortune's 32:16 microcomputer line.

The low-end PS series, which includes the PS 10 and the PS 20 with 10M- and 20M-byte hard disks, can reportedly be expanded from the present 512K-byte random-access memory (RAM) to 1M-byte RAM. With the added memory, the systems can support up to five users instead of three.

The PS series' prices have been reduced by $2,000 to $5,995 for the PS 10 and $6,995 for the PS 20.

The XP series will now include an XP 45 model capable of supporting from three to 13 users. The XP 45 is said to include 45M bytes of formatted hard memory with a 30-msec access time. It is priced at $14,995.

Fortune Systems, 101 Twin Dolphin Drive, Redwood City, Calif. 94065.

TEXAS INSTRUMENTS, INC.
Enhanced TI Business System 352/352A

Texas Instruments, Inc. has enhanced TI Business System 352/352A so that it incorporates a high-performance formatter board.

The formatter board, responsible for transferring data to and from the unit's WD500A Winchester disk, has been upgraded to allow faster data transfer, TI said. Additional VDTs can now be used with the system without decreasing response time, the vendor said.

The price of the Business System 352/352A remains $9,995.

Texas Instruments, Data Systems Group, P.O. Box 402430, Dallas, Texas 75240.

COMMUNICATIONS

NATIONAL MEMORY SYSTEMS CORP.
PC 8000-AT; NMS PC.25; NMS 8000-AT

National Memory Systems Corp.

Continued on page 114

If you're not in *Computerworld's* next two special reports, look at the issues you'll miss

November 26

Data Communications Terminals

In this issue, users and vendors will comment on how terminals are making computers more responsive to organizational needs. Topics include: how to get the most out of dumb terminals; an update on smart and intelligent terminals; and guidelines for determining terminal needs and selecting the equipment to meet them.

Closes November 9

December 31 & January 7

'85 Forecast

Our annual review and forecast issue. We'll examine some of the major events of 1984, and explore what lies ahead in 1985.

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To: Ed Marecki
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A PUBLICATION OF CW COMMUNICATIONS

MICROCOMPUTERS

Continued from page 112

(NMS) has introduced a mass memory subsystem, the PC 8000-AT, for the IBM Personal Computer AT and tape backup systems for the IBM Personal Computer and AT.

The PC 8000-AT is a desktop unit reportedly capable of providing 80M, 168M or 335M bytes of add-on mass storage. Rack-mountable units are also available for additional storage of up to 1,000M bytes. The PC 8000-AT offers the potential for use as a file server with the Personal Computer AT.

The tape backup unit for the Personal Computer, the NMS PC.25, reportedly is a 67M-byte cartridge, ¼-in. tape system. The tape backup for the Personal Computer AT, the NMS 9000-AT, is said to be a low-profile, nine-track, 1,600 bit/in. Ansi-IBM format tape aystem.

The PC 8000-AT is priced at $5,600 for 80M bytes, $9,500 for 168M bytes and $12,500 for 335M bytes. The NMS PC.25 is $2,300. The NMS 9000-AT is $5,700.

National Memory Systems, 355 Earhart Way, Livermore, Calif. 94550.

SAMSUNG ELECTRONICS AMERICA, INC.
MD-1254G

Samsung Electronics America, Inc. has announced MD-1254G, a 12-in. monochrome monitor designed for the IBM Personal Computer line.

The monitor reportedly is available with either a green or amber phosphor screen. The MD-1254G features a dual intensity signal level, 25 80-char. lines — including a status line — and brightness and contrast controls, according to the vendor.

MD-1254G sells for $199.95

Samsung Electronics America, 117 Seaview Drive, Secaucus, N.J. 07094.

SMITH CORONA
Fastext-80

The Smith Corona division of SCM Corp. has introduced a dot matrix printer that will retail for $259. The Fastext-80 reportedly prints 80 char./sec with 10 char./in. on an 80-char. line.

The printer also is said to offer six pitches. In addition to 10 char./in. pica type, it will produce 12 elite char./in., 16.7 condensed char./ in. and five, six or 8.3 enlarged char./in.

The printer can produce emphasized print, bit-image graphics and true descenders. It offers a full-line buffer, a 96-char. Ascii character set, bidirectional printing and a standard Centronics Data Computer Corp. parallel interface.

Smith Corona, 65 Locust Ave., New Canaan, Conn. 06840.

SAKATA U.S.A. CORP.
SC-100

Sakata U.S.A. Corp. has announced SC-100, a color monitor that runs on a number of microcomputers, including Apple Computer, Inc.'s Apple IIe and the IBM Personal Computer.

The 13-in. monitor weighs approximately 31 lb and displays up to eight colors and 1,000 characters, Sakata said. The product reportedly features phone pin jack, sound, contrast, power switch, vertical hold, color, tint and brightness controls.

SC-100 costs $329.

Sakata U.S.A., 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

SOFTWARE LINK, INC.
PC Shadow

Software Link, Inc. has announced PC Shadow, a 25-line monitor for the IBM Personal Computer.

The product will support IBM Personal Computer graphics characters and screen attributes such as reverse video, highlighting, blinking and low intensity.

PC Shadow also is said to supply terminal emulation for Televideo Sytems, Inc.'s 925 terminal. The monitor supports an auxiliary printer port that supplies a data path for transmitter-on or transmitter-off communications protocols.

PC Shadow costs $895.

Software Link, Suite 336, 8601 Dunwoody Place, Atlanta, Ga. 30338.

KIMTRON CORP.
KT-7/PC Data Display Terminal

Kimtron Corp. has announced the KT-7/PC Data Display Terminal, said to enable users to convert the IBM

Continued on page 118

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MICROCOMPUTERS

Continued from page 114

Personal Computer, Personal Computer XT, Personal Computer AT and compatibles into a time-sharing, multitasking and multiuser computer system.

The KT-7/PC provides the company's proprietary features, including scrollable and addressable 25th line of display, personal computer look-alike graphics character sets and identical video attributes presentation, the company said.

The KT-7/PC also includes standard Ascii terminal emulation. The terminal is $895.

Kimtron Corp., 2225-1 Martin Ave., Santa Clara, Calif. 95050.

C. ITOH DIGITAL PRODUCTS, INC.
Starwriter A10-30

C. Itoh Digital Products, Inc. has introduced a version of its Starwriter daisywheel output printer said to operate at a speed of 29 char./sec.

The Starwriter A10-30, an enhanced version of the 21 char./sec Starwriter A10-20 printer, reportedly works at a speed that is 38% faster than the A10-20 model.

The printer offers a 138-char. column width; a 200-byte print buffer, expandable to 8K bytes of memory; bidirectional printing; and an RS-232 or Centronics Data Computer Corp.-type parallel communications interface. The 36.4-lb Starwriter is said to operate below 62db.

The A10-30 is priced at $825.

C. Itoh Digital Products, Suite 220, 19750 S. Vermont Ave., Torrance, Calif. 90502.

ENTER COMPUTER, INC.
Sweet-P Six-Shooter

Enter Computer, Inc. has introduced the Sweet-P Six-Shooter plotter, a six-pen plotter for business and engineering applications.

The product reportedly can draw on 8½- by 11-in. or 11- by 17-in. paper or Mylar at speeds up to 14 in./sec. Both RS-232 and Cetronics Data Computer Corp.-type parallel connectors are included, the vendor said.

The plotter reportedly connects to most computers and is language-compatible with Hewlett-Packard Co. products. Products such as Lotus Development Corp.'a 1-2-3, Microsoft Corp.'s Chart and Ashton-Tate's Framework work with Sweet-P Six-Shooter, Enter said.

The product is priced at $1,095.

Enter Computer, 6867 Nancy Ridge Drive, San Diego, Calif. 92121.

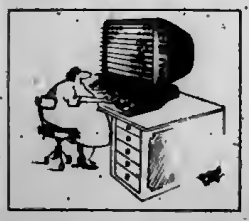
TEAL INDUSTRIES, INC.
Model 418 Printer

Teal Industries, Inc. has introduced a daisywheel parallel interface printer. The Model 418 offers an 18 char./sec print speed, using a 96-char. daisywheel with 10, 12 and 15 pitch.

The Teal 418 takes 13-in.-wide paper and has a friction feed paper system with optional forms tractor and automatic cut-sheet feeders available. It can print an original and four copies cleanly with a four-level impression control, Teal said.

Price of the Teal 418 printer is $545. An optional RS-232C interface will be available in 60 days for an additional $130.

Teal Industries, 1741 Lomita Blvd., Lomita, Calif. 90717.



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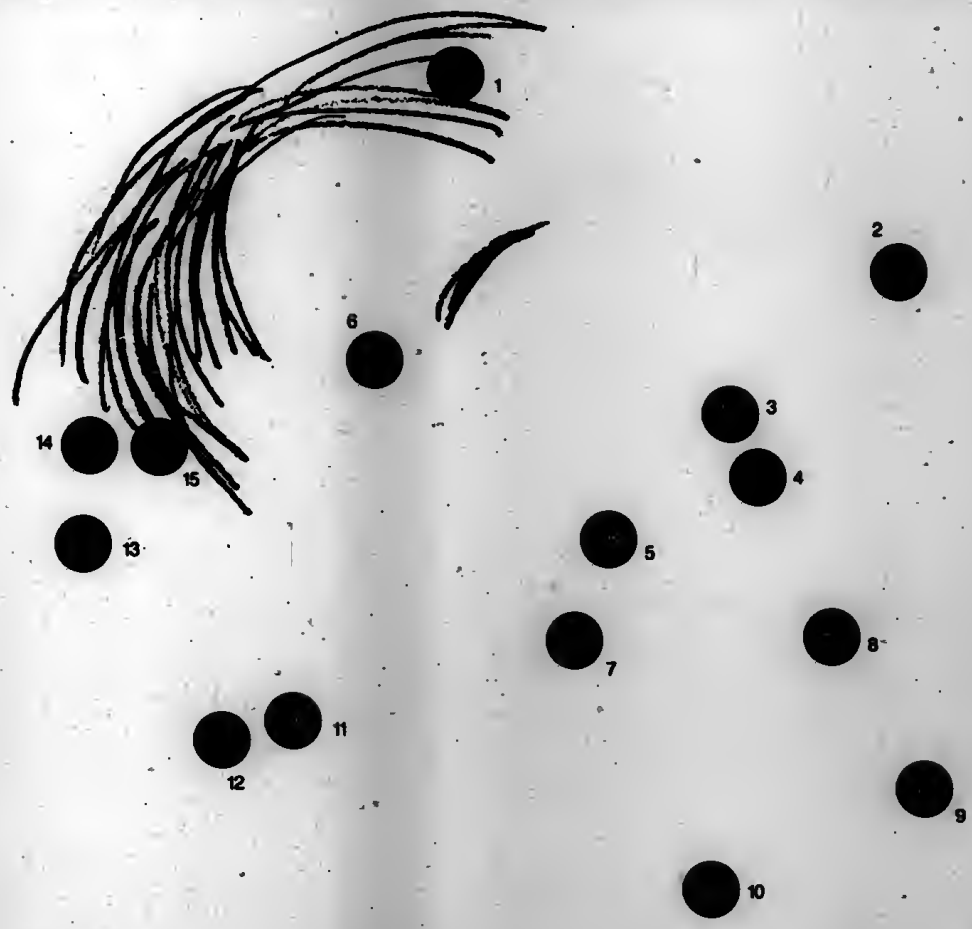

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MICROCOMPUTERS

STATISTIC from page 103

Inc.'s SAS and BMDP Statistical Software, Inc.'s BMDP. Versions of both SPSS and BMDP are now available for microcomputers, although they require rather more than an average personal computer.

SPSS/PC requires an IBM Personal Computer XT or its equivalent, at least 380K bytes of memory and preferably an Intel Corp. 8087 coprocessor.

BMDP sells its package on its own Motorola, Inc. 68000-based microcomputer, which provides the capability of running Microsoft Corp.'s MS-DOS.

Other statistical systems are available from smaller firms. Some of the better packages are Microstat from Ecosoft, Inc. of Indianapolis and Systat from Systat, Inc. of Evanston, Ill.

When using both spreadsheet and statistical programs, a user should realize that it is often difficult to transfer data among applications. Buyers should look for a common data format because both a spreadsheet and a statistical package might provide different analyses of the same data.

The most common data transfer standard — the data interchange format file — is supported by programs such as Lotus Development Corp.'s 1-2-3.

HARVARD from page 103

against an original plan. The package provides critical path method, Gantt and Pert charts, which enable the buyer to visualize a project.

In the summer of 1983, Harvard released Harvard Project Manager. "Harvard Project Manager is designed for the average person who has to manage a task," said Shakeel Mozaffar, director of marketing at Harvard. "Total Project Manager is designed for a more sophisticated audience."

The product runs on an IBM Personal Computer, Personal Computer XT and Personal Computer AT with 384K bytes of random-access memory and IBM's PC-DOS.

Total Project Manager costs $495.

More information is available from Harvard Software, located at 521 Great Road, Littleton, Mass.

LINKUP from page 103

Emulation Software (Aterm); Asynchronous Block Emulation Software (Ablock); VT52/100 Terminal Emulation Software; and emulation software for 3270 Systems Network Architecture (SNA), 3270 Binary Synchronous Communication (BSC), 3770 SNA and 3780 BSC terminals.

Information Technologies' terminal emulation software is said to provide access to multiple networks under a menu-driven job scheduler, which allows unattended automatic dial-up, logon, file transfer and job and program execution.

In addition, the firm introduced the Linkup XT and the Linkup XT+ adapter boards. The Linkup XT and XT+ are said to offer a line-speed capability of up to 19.2K bit/sec and are intended for use with the firm's 3270 SNA, 3270 BSC, 3770 SNA or 3780 BSC communications software.

The Linkup XT adapter board was designed for remote synchronous connection, while the Linkup XT+ was developed to use IBM asynchronous-compatible software for remote asynchronous connection or Information Technologies' software for synchronous connection, the firm said.

The Linkup XT+ board is packaged in a short-board format so that it can be used with IBM or IBM-compatible portables, the firm said.

The Linkup 1 system, including adapter board, cable and one software package (Aterm, Ablock, VT 52/100 and choice of 3270 SNA, 3270 BSC, 3780 BSC or 3770 SNA) is available now at $999.

The Linkup XT system, which includes an adapter board, cable and one software package (3270 SNA, 3270 BSC, 3780 BSC or 3770 SNA) is also available now at $785.

The Linkup XT+ system, which includes an adapter board, cable and one software package, will be available in November. The price has not yet been set.

Additional synchronous software packages for the Linkup systems are currently priced from $100 to $150.

Further information may be obtained from Information Technologies, 7850 E. Evans Road, Scottsdale, Ariz. 85260.

PROTECT from page 103

dors "are going to have to be convinced they can recover 10% to 20% in incremental revenues that they are losing to piracy," Kapor maintained.

But he noted that software developers may make the devices available for free if the reduced pirating increases revenues. Kapor said Lotus' goal is to get costs down to the point where the company can absorb the costs through added revenues.

Written papers describing proposals of various aspects of the device will be available from Adapso in about a month, Kapor said.

'Now let me get this straight — you want Arbor Day off because you're a Druid?'

COMPUTER INDUSTRY

Chips down, but rebound expected

By Kathleen Burton
CW West Coast Bureau

In the midst of an aggressive capital investment cycle, the wild growth of the semiconductor industry recently dipped, but industry participants said they believe the downturn is a short-term correction.

According to a key indicator released by the Semiconductor Industry Association (SIA) recently, the number of new orders for semiconductors in September plummeted below the number of shipments for the first time in two years.

The SIA reported that the industry's book-to-bill ratio fell to 0.84 in September, 5% below last year's figure and close to the industry's all-time low of 0.77 posted in 1980. The book-to-bill ratio compares new orders that chip makers receive over a three-month period with orders already filled. A book-to-bill ratio of 0.84 means that chip makers received new orders worth $84 for every $100 worth of chips shipped to customers.

Semiconductor orders have steadily declined since January, when the book-to-bill ratio reached 1.53, and analysts and chip manufacturers are blaming a variety of factors: the personal computer shakeout, long-term excess capacity, commodity pricing, the threat of the Japanese and the specter of a recession.

Temporary drop

Most industry observers believe the drop is temporary and say business activity is stronger than the ratio shows. SIA President Thomas D. Hinkelman said an 11% decline in September semiconductor orders, combined with record high shipment levels, caused the disproportionate book-to-bill figure.

With customer inventories high and ordering lead times shrinking, orders fell as billings soared to $1.16 billion, almost 12% higher than the previous shipment record set in August 1984, according to Hinkelman. "What we are seeing is a necessary correction in customer inventories," he said.

He predicted the market will become balanced by the end of the year and that growth will resume.

Michael Kubiak, SIA statistics director, said the SIA is sticking to its forecast of a 48% growth rate in worldwide semiconductor shipments for 1984, with worldwide growth expected to flatten to 20% annually for the next three years. The 1987 worldwide integrated circuit market will total $43 billion, he said.

Mike Gumport, a semiconductor market analyst at Paine Webber, Inc. in New York, said that orders have dropped because inventories are being purged by equipment manufacturers' panic double ordering, made when chip supply was scarce. If 20% of the orders placed between May 1983 and

See CHIPS page 131

■ Mismanagement may be the biggest threat facing companies in the computer software and services industry, the chairman of Informatics General Corp. said recently/**126**

■ Eagle Computer, Inc. moved its headquarters and reported that for the fourth quarter it suffered a net loss amounting to almost four times the amount it took in in revenues. Meanwhile, a Boulder, Colo.-based micro manufacturer simply closed its doors/**130**

INDUSTRY INSIGHT
Kathleen Burton
CW Staff

Disk makers face battle for survival

The word on the street is that the long-predicted shakeout in the floppy and hard disk industries is already in high gear, and the reason, according to experts, is both generic and company-specific.

Flexible disk media and drive manufacturers Verbatim Corp., Miniscribe Corp. and Shugart Corp. all have announced work force reductions and posted substantial quarterly losses. The financially beleaguered magnetic disk manufactuer Dysan Corp. will be merged with Xidex Corp., a successful magnetic media manufacturer in Sunnyvale, Calif. Winchester disk drive maker Interna-

See DISK page 139

Dysan, Xidex plan merger

By Kathleen Burton
CW West Coast Bureau

Two Silicon Valley-based floppy disk manufacturers recently announced merger plans, claiming to have solidified their respective strengths in the magnetic and rigid media industries.

Spokesmen for the financially beleagured Dysan Corp., headquartered in Santa Clara, Calif., and Xidex Corp. of Sunnyvale, Calif., said the proposed agreement will provide Dysan shareholders with seven-eighths of one share of Xidex common stock for each share of Dysan stock. Following the merger, current Dysan shareholders would own 40% of the combined firm, and current Xidex shareholders would own the remaining 60%. "The merger will make us one of the strongest floppy disk [firms] in the world and a volume leader," said Bert Zaccaria, executive vice-president of Xidex.

Zaccaria said Dysan brings to the deal 10 years of successful experience in the floppy disk industry, brand name recognition in the retail market and an advanced oxidizing process for manufacturing hard disks. Xidex offers low-cost, high-volume floppy disk manufacturing, he said, the result of a $30 million disk-coating plant built last year.

Xidex, which makes microfilm for computers, posted an increase of 58% over year-earlier sales figures for the quarter ended June 30. Its disk subsidiary, Xidex Magnetics, posted $47 million in sales for the quarter, a 468% increase over last year's figure. In contrast, Dysan Corp. recently reported a $15.8 million loss for the quarter on sales of $52.5 million. The Dysan setback, according

See XIDEX page 139

Fault-tolerant start-ups find going rough

By John Desmond
CW Staff

One industry axiom declares that given enough time and money, a team of top engineers can build one of anything.

But in trying to move their design out of the laboratory and into the hands of end users, two start-up companies in the fault-tolerant, on-line transaction processing marketplace have run into a series of setbacks and disappointments.

Auragen Systems Corp. of Fort Lee, N.J., and Synapse Computer Corp. of Milpitas, Calif., are both trying, along with a dozen or so other start-up companies, to make a name for themselves in a field dominated by seasoned companies like Tandem Computer, Inc., Computer Consoles, Inc. and Stratus Computer, Inc.

Auragen offers the System 4000, said to be expandable to 32 clusters, with each cluster consisting of from two to 10 microprocessors, usually Motorola, Inc. 68010s or 68000s. The clusters are loosely coupled by two 16M bit/sec buses. The system runs under Auros, the company's version of AT&T's Unix System III and is said to support a variety of programming languages, communications protocols and networks. Fault tolerance is achieved with a combined hardware and software approach.

The System 4000 was announced in April 1983. The company reached an OEM agreement with Nixdorf Computer AG of West Germany and was scheduled to ship systems to Nixdorf last October. Shipments were expected to begin in the U.S. in the fourth quarter of 1983.

Explaining the delay, Richard Schreiber, Auragen's director of marketing, said, "There was a trade-off we made to do development for the fault-tolerant work." Auragen has begun shipping systems, but only to test sites and not in the configurations described in the company's literature. According to Schreiber, the largest cluster shipped so far is two. A total of nine customers have 70 clusters installed at beta sites, the location of which he declined to reveal. Of the nine customers, four have fault-tolerant systems, he said.

Auragen expects to offer the third cluster in the first half of 1985, Schreiber said, adding, "Once we do three, we've got 32," the maximum configuration.

See FAULT page 127

Past year marked by record-setting number of mergers

FRENCHTOWN, N.J. — Even before IBM's decision to acquire Rolm Corp., 1984 had produced a record pace of merger activity in the computer software, services and information industry, according to the Cerberus Group, Inc.

The consulting company's periodical report on merger activity in the computer industry, *The Cerberus Report*, stated that in the first six months of 1984 a number of very large transactions pushed the total dollar value of mergers and acquisitions to $3.62 billion.

Among the 104 transactions through those first six months were the $2.55 billion acquisition of Electronic Data Systems Corp. by General Motors Co., the $307.5 million acquisition of Tymshare, Inc. by McDonnell Douglas Corp. and a $260 million investment in the Italian

See MERGER page 138

COMPUTER INDUSTRY

Intel Corp.

SANTA CLARA, Calif. — Intel Corp. recently reported that its third-quarter profit increased 118%, but cautioned that the growth will probably slow in coming quarters.

Profits climbed to $70 million, or 60 cents a share, from $32 million, or 29 cents a share, in the year-earlier period. Profits for the quarter ended Sept. 30 included a one-time $19.3 million reduction in income tax liabilities, the company said.

Revenue for the period increased 48% to $432 million from $292 million a year ago.

Revenue and profit growth during the latest quarter was slower than preceding quarters, the company noted. One reason for the slowdown, the company noted, was an inability to increase production as fast as planned at its Albuquerque, N.M., wafer fabrication plant. The company also said that increased capacity expansion by semiconductor manufacturers has brought supply more in line with demand.

"As a result," said Andrew S. Grove, president and chief operating officer, "orders received this quarter were approximately the same as our shipment level, but below our earlier expectations.

Apple Computer, Inc.

CUPERTINO, Calif. — Apple Computer, Inc. reported revenues of $1.5 billion for the year ended Sept. 28, a 54% increase over 1983 revenues of $982.7 million. Profits for the year were $64 million, or $1.05 per share, down from 1983 profits of $76.7 million, or $1.28 per share.

Almost half of the profit for the year was generated in the fourth quarter, when the company posted earnings of $30.8 million, or 50 cents per share, up considerably from a disappointing fourth quarter in 1983 when profits were only $5.1 million, or 8 cents per share.

Revenues for the fourth quarter were $477.4 million, up 75% from year-earlier revenues of $273.2 million and up 13% from the second quarter of 1984.

Federal government tax changes contributed $4.9 million to the fourth-quarter profits. The lower yearly profits included a $24 million reduction in income taxes, with the company showing a pretax profits dip of more than $36 million.

John Sculley, company president and chief executive officer, said the company exceeded profit goals during a year marked by major development and marketing investments.

NCR Corp.

DAYTON, Ohio — NCR Corp. recently reported a 38% increase in profits for the third quarter and a 9% gain in revenues.

Profits increased to $96.9 million, or 95 cents a share, from $70.2 million, or 64 cents a share, during the year-earlier period. The profit included a $30.6 million, or 30 cents a share, nonrecurring gain resulting from tax law changes. Last year, the company's third-quarter profit included a gain of $8.4 million, or 6 cents a share, from the sale of securities. The per-share results also reflected a four-for-one stock split last April.

Earnings per share for the quarter were aided by the company's stock repurchase program started last April, the company said. Revenues for the latest quarter rose to $956.7 million from $877.9 million.

Wang Laboratories, Inc.

LOWELL, Mass. — Wang Laboratories, Inc. recently reported a 32% increase in profits for the first quarter as well as a 34% increase in revenues.

Profits for the quarter ended Sept. 30 were $51.2 million, or 36 cents a share, compared with $38.9 million, or 29 cents a share, in the same period one year ago.

Revenues climbed to $553.8 million from $412 million in the year-earlier period.

The company said that despite the negative effect the strong U.S. dollar has on overseas sales, operating earnings increased 50% over last year's first quarter.

Apollo Computer, Inc.

CHELMSFORD, Mass. — Apollo Computer, Inc., continuing its rapid growth this year, recently reported that profits more than doubled from the third quarter ended Sept. 29.

Profit climbed to $6.3 million, or 20 cents a share, from $3 million, or 10 cents a share, a year ago.

Revenues were $57.4 million, an increase of more than 150% from $21.1 million a year ago.

Demand for the company's products — 32-bit engineering and scientific workstations — was "very strong," said Thomas A. Vanderslice, president and chief executive officer.

"We recognize the need to develop our company rapidly to respond to this tremendous market opportunity," he said.

Lotus Development Corp.

CAMBRIDGE, Mass. — Lotus Development Corp. reported that third-quarter profits almost doubled to $9.1 million, or 57 cents per share, compared with year-earlier profits of $4.7 million, or 35 cents per share.

For the quarter ended Sept. 29, Lotus reported revenues of $45.6 million, compared with $16.4 million for the comparable period one year ago.

Mitchell D. Kapor, chairman and chief executive officer of the company, said demand for 1-2-3, the firm's initial product, continued to be very strong.

For the first nine months of the fiscal year, Lotus earned profits of $24.2 million on revenues of $106.5 million. One year ago, the company had nine-month profits of $7.5 million on revenues of $29.1 million.

NICKELS AND DIMES

Management Science America, Inc.

ATLANTA — Confirming earlier projections, Management Science America, Inc. (MSA) recently reported a third-quarter loss of $1.8 million, or 11 cents per share. That compared with MSA's year-earlier loss of $350,000, or 2 cents per share.

For the third quarter, MSA reported revenues of $31.2 million, up from $27.9 million in the comparable period one year earlier.

MSA said it now expects to report lower earnings per share for 1984 than it reported for 1983.

Earnings per share were 63 cents in 1983, MSA said.

For the first nine months of 1984, the company posted a loss of $3 million, or 17 cents per share, compared with a profit of $574,000, or three cents per share, for the first nine months of 1983.

MSA President William M. Graves said, "The prime factor in our reduced 1984 earnings is the performance of our retail microcomputer software subsidiaries."

In an earlier announcement, MSA had announced its intention to sell that portion of its business, including most of the Peachtree Software, Inc. subsidiary, or spin it off into a separate company. MSA said its mainframe software revenues increased 22% over the first nine months of 1984, and it projected traditionally strong fourth-quarter revenues from mainframe software.

AT&T

NEW YORK — AT&T recently announced that third-quarter profits and revenues both slipped from second-quarter results, continuing a disappointing trend in the first year of operations after divestiture.

The telecommunications giant reported profits for the quarter were $317 million, or 28 cents per share, down 30.5% from the previous quarter's profits of $456 million, or 43 cents per share. Revenues for the quarter were $8.01 billion, down from $8.63 billion in the previous quarter.

Because this is AT&T's first year divested of the regional operating companies, no year-earlier comparisons are available.

However, AT&T, just prior to divestiture, forecast it would experience profits of $2.02 per share for the current year. For the first nine months, the company has reported earnings per share of 91 cents, only 45% of the forecast. Conversely, the seven regional telephone holding companies spun off in the divestiture have reported nine-month earnings-per-share figures ranging from 73% to 85% of the predivestiture forecasts.

AT&T said a sizable part of the reduction in profits could be attributed to accounting considerations.

Amdahl Corp.

SUNNYVALE, Calif. — Despite a one-time $7.1 million tax credit, Amdahl Corp. reported an almost $2.5 million dip in profits for the third quarter ended Sept. 28, compared with profits a year earlier.

Revenues were off almost $20 million from the year-earlier period, according to Amdahl.

The company reported profits of $11.2 million, or 25 cents per share, compared with year-earlier profits of $13.7 million, or 30 cents per share. The third-quarter profits included a $7.1 million credit resulting from the government's move earlier this year to eliminate domestic international sales corporations and forgive deferred income taxes, the company said.

Revenues for the quarter were $180.6 million, down from $200.1 million reported for the period one year ago.

For the first nine months of the current fiscal year, Amdahl's revenues are $599,000 below that reported for the comparable period in 1983.

Profits for the first nine months are off almost $10 million from last year.

The company attributed the quarterly results to a delay in increased processor shipments, price reductions as well as foreign currency rates.

Despite the bad news, Amdahl President John C. Lewis said an improved processor shipment rate late in the quarter should continue into the fourth quarter and combine with increased availability of storage products and reduced expenses to result in the best quarterly financial performance for the year.

"The current market activity combined with the demand for and availability of Amdahl products and product features lead us to believe that our momentum will be strong as we enter 1985," Lewis said.

MCI Communications Corp.

WASHINGTON, D.C. — MCI Communications Corp. recently reported that its profits plummeted 86% for the second quarter ended Sept. 30 to $7.1 million, or 3 cents a share, from $51.5 million, or 22 cents a share, a year earlier.

Revenue climbed 21% to $478 million from $396 million, according to the company.

William E. Conway Jr., senior vice-president and chief financial officer, said revenues were adversely affected by the offering of volume discounts and the elimination of monthly fees for MCI customers effective last June.

RELIABILITY

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Superminis revive industry, challenge mainframe mart

OUTSIDE LINES
Bohdan Szuprowicz

The emergence of powerful microcomputers was accompanied by dire predictions that the minicomputer was doomed. Some micros displaced low-end minis here and there, and some minicomputer executives deserted their companies to start new ventures. But those new ventures are turning out to be fast-growing supermini-computer manufacturers that are breathing new life into the minicomputer industry and threatening some of the well-entrenched mainframe vendors once again.

Of the 52,000 estimated supermini installations in the U.S., over 75% are in use for science and engineering applications. This already represents an investment close to $20 billion, and if industry forecasters are right, this figure may well double in a few more years.

Although this market does not grow much more than 25% to 30% per year; the absolute numbers are very big and impressive to hungry venture capitalists and investors. As a result, significant funds have been invested during the last two years to finance new ventures developing high-performance superminicomputers.

The latest new venture entering the supermini race is Encore, a 1983 start-up founded by top executives and minicomputer veterans from Digital Equipment Corp., Data General Corp. and Prime Computer, Inc., all of which are major manufacturers with significant market shares in this business.

Encore is now developing a range of high-performance superminis with processing speeds from 1 to 100 million instructions per second (Mips) and is using the parallel processing technology to accomplish its objective. The new venture so far does not have a product on the market, but nevertheless hopes to become a $400 million company in 1988 and a $1 billion firm by 1990. The founders raised initial capital consisting of $22 million in private placements and $30 million in bank credits; but although the investors reportedly include such prestigious firms as the First Boston Corp., Solomon Brothers, Schlumberger and Sperry Corp., Encore was not able to obtain any significant financing from the professional venture capital funds and investors.

One reason may have to do with earlier venture capital financings of about half a dozen supermini start-ups that are now reaching a point where they will need additional expansion capital during a period when the stock market valuations deter new ventures from going public. Many ventures with a stake in those companies may prefer to conserve their capital should it be needed by those start-ups for marketing their products and are probably reluctant to invest in another latecomer to the same game already under way for a couple of years.

Sequent Computer Systems was probably the last of the recent new supermini ventures; it was started in 1983 through a group exodus from Intel Corp. and received $13 million in two rounds of financing from an impressive group of leading

See FIRMS page 136

Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

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Software industry management could be its own enemy

By Peter Bartolik
CW Staff

MIAMI — The biggest threat facing the computer software and services industry is the industry itself, according to Walter Bauer, chairman and chief executive officer of Informatics General Corp.

Bauer made that observation during an address to the 61st Management Conference of the Association of Data Processing Service Organizations (Adapso) held here recently. "We are our biggest threat," Bauer declared. "This threat [is] mismanagement."

Bauer noted that most executives in the industry were not trained in management, but rather were thrust into complex management positions through rapid growth. Such executives, he warned, "must develop a strong respect for cash and liquidity."

The inability of industry executives to manage growth may be one reason for a series of company acquisitions this year, Bauer suggested. On a different topic, Bauer suggested the fears of IBM moving into the systems software business may be an overreaction. "We all understand IBM has the resources to dominate any area it wants to, but IBM cannot dominate all areas," he said. An IBM source told Bauer Big Blue has no intention of competing with software companies, "but my highly placed source did not put it in writing," he said.

Bauer said he understood that IBM will only compete in software in order to generate hardware sales. Asserting that software tends to drive toward vertical markets, he declared, "No hardware company wants to be identified with vertical markets. [A hardware company] has to be perceived as selling hardware across the board."

Nevertheless, Bauer also predicted that software companies feeling the pinch from IBM will participate in and initiate efforts to limit IBM through judicial restraints. "Within the next 10 years it is inevitable that there will be another round of antitrust actions against IBM, and some will be initiated by the software industry," he said.

On the brighter side, Bauer predicted that the still-developing microcomputer market will bring opportunities to established software companies. Those opportunities just beginning to develop lie in areas such as micro-to-mainframe links, micro-to-micro links and networking, he said. He also predicted that by the end of the decade, software companies will account for half of all micro hardware sales.

Another Adapso speaker also predicted vast opportunities for software companies. Incoming Adapso Chairman Arthur Kramer, co-founder and chairman of Cherry Hills, N.J.-based Mobix Partners and the founder of Praxa Corp., predicted that more and better comprehensive software "will take us to a higher plateau in business management."

Kramer, who succeeded Endata, Inc. Chairman and President Douglas Altenbern as head of Adapso, said the industry is poised to begin a new phase of growth and development and "the driving force is software."

Kramer also maintained that managers at U.S. companies need solutions that fully integrate all aspects of the business. "Only our industry with its strength, creativity and entrepreneurial spirit can lead the way to developing integrated solutions to help the companies we serve become more vital and growing organizations," he said.

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M&D, ADR ink pact; Millennium to run in Datacom/DB

NATICK, Mass. — McCormack & Dodge Corp. (M&D) and Applied Data Research, Inc. (ADR) have signed a complementary development and marketing agreement that will enable M&D's Millennium product series to run in ADR's Datacom/DB data base management system (DBMS) environment.

The agreement provides for joint development of native versions of all Millennium business application systems to run under Datacom/DB. The native versions will be able to call Datacom/DB records directly rather than having to route calls through IBM's Vsam.

The agreement covers current M&D offerings in the areas of general ledger, human resource management, accounts payable, purchase order, fixed assets, capital projects, its Interactive PC Link for the IBM Personal Computer and any future applications. However, M&D's Millennium:SDT system development software, which competes indirectly with ADR's Ideal product, is not included.

Bob Weiler, senior vice-president at M&D, said the company had modified its products in a similar manner to work with IBM's IMS. That conversion took about six months. However, Weiler would not specify when the native versions of the M&D products would be available. He said pricing would be in line with prices for the IMS versions of the applications software.

The announcement came just four months after the unveiling, with great fanfare, of a similar agreement between Management Science America, Inc. (MSA) and ADR. The deal was said to provide for "technology transfer" and shared information on prospective customers between the two companies.

M&D, which is a chief rival of MSA, took a lower key approach to the announcement. However, Martin Goetz, president of ADR, said the deals were fundamentally the same.

Goetz and Weiler said the announcement was not intended to steal MSA's thunder. Goetz said ADR had been seeking an agreement with M&D for several years. He added that the agreement continues ADR's aim "to stay exclusively in the system software area and build interfaces to all applications." He said ADR will take a neutral position in sales situations involving competing vendors.

'Not a surprise'

MSA Chairman John Imlay said the agreement was "not a surprise," and added that MSA's involvement with ADR is "a little heavier" than is M&D's. The MSA-ADR agreement does provide for MSA to market Datacom/DB and ADR/Datadictionary in combination with certain applications.

Such an arrangement, however, is not part of the M&D-ADR deal. Under the terms of that agreement, M&D is responsible for training, support and maintenance of the Millennium application systems, and ADR is responsible for support and maintenance of the DBMS. M&D and ADR will continue to market the products separately.

Weiler said the announcement helps to solidify M&D's assertion that it is not moving into the data base field. That issue, he acknowledged, had been somewhat cloudy following M&D's announcement last year of Millennium, an application development technology that includes many features of a DBMS.

The agreements with MSA and M&D are not the first for ADR. The company has similar agreements with Comserv Corp. and Walker Interactive Products, Inc.

Goetz said the arrangement gives ADR an advantage over rival Cullinet Software, Inc. by offering prospects a choice. "They can buy the best financial and the best manufacturing software and know they'll all work together through Datacom/DB," he said.

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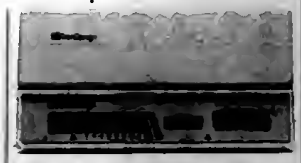

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FAULT from page 121

The firm recently laid off 32 workers, reducing its staff to 57, while refocusing its marketing effort away from end users and toward OEMs.

Synapse offers the N+1, a closely coupled multiprocessor system based on the Motorola 68000 that can be expanded to up to 28 tightly coupled processors. The processors are built around the Synapse expansion bus, said to provide a data transfer rate of 64M byte/sec. The N+1 runs the company's own Synthesis operating system, which has a built-in relational data base management system (DBMS). All system software is written in Pascal.

Synapse announced the N+1 in August 1982, and an initial field test system was delivered in December 1982. Six N+1s were delivered in 1983, the last in October, and those operated at 75% capacity, according to Armond Inselberger, Synapse product marketing manager. No more systems were shipped until recently, when the company announced that the Nashville Police Department has ordered two N+1s.

Why were these two companies late in shipping products? "The problem at Synapse is that they were overly ambitious," said Omri Serlin, president of Itom International Co., a research and consulting firm in Los Altos, Calif., that specializes in fault tolerant and on-line transaction processing systems. The tightly coupled N+1 multiprocessor system with fault tolerance was complex. "On top of all that, [Synapse] decided to develop a completely brand-new proprietary operating system and [DBMS]," Serlin said. "No new science was required to make it work, but the engineering aspects of it were pretty overwhelming."

Synapse was required to write 450,000 lines of Pascal code for its operating system, representing a programming effort of 42 man-years, Inselberger said. The company felt its operating system approach was needed to solve the historical problem of contention — too many transactions competing for too little memory — that has prevented the success of multiprocessor shared-memory systems in the past.

Auragen had a less ambitious strategy of using AT&T's Unix, although major surgery was required to make Unix work in a fault-tolerant system for transaction processing. Auragen has invested 40 man-years to develop the Auros operating system. "The system was more of an invention than an adaptation," Schreiber said.

have also been experienced at Auragen. As part of its OEM agreement with Nixdorf, the company had to redesign its hardware to fit more closely with Nixdorf's packaging. "It did cause a certain amount of delay," Schreiber said, but he claimed the redesign improved the product.

Despite the delay in getting his product to market, Synapse's Inselberg still believes the window of opportunity for his firm is open, especially since the trend seems to be that fault tolerance will become a feature of most multiprocessor systems.

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Tektronix wins trade secret suit

By David Gimes
CW Staff

BEAVERTON, Ore. — Tektronix, Inc. recently announced the settlement of a trade secret suit against Northwest Instrument Systems, Inc., a start-up company founded here in 1981 by former Tektronix employees.

Tektronix, a manufacturer of computer equipment for scientific and engineering applications also based here, filed the suit last September in the state Circuit Court of Washington County, charging that Northwest had intentionally recruited Tektronix employees in order to gain proprietary information it then used to develop products.

The suit also alleged that Northwest paid several Tektronix employees to design components for Northwest, utilizing Tektronix's proprietary information.

The settlement orders the appointment of a technical expert to monitor certain product development activities at Northwest. The monitor's purpose is to assure that products under development at Northwest do not utilize trade secret information that Northwest employees learned while employed by Tektronix. The agreement further prohibits Northwest from hiring technical, professional or managerial employees from certain product groups at Tektronix that compete with Northwest. Northwest also consented to a one-year ban on recruiting Tektronix employees.

The settlement, however, did not include the injunction sought by Tektronix that would prevent James Cavoretto, former general manager of Tektronix's Laboratory Instruments Division, from working as vice-president of engineering at Northwest for a one-year period. Tektronix had claimed that Cavoretto was privy to confidential information involving Tektronix's Computer-Based Instruments (CBI) Strategic Program Unit and that Northwest was using that information to help develop products that would compete directly with the CBI line.

"Northwest assured us that there has been no misuse of Tektronix's trade secrets or confidential information and that there will be no misuse of such information in the future," said Tektronix President Carl Wantland. "We are satisfied with Northwest's cooperation in this matter and are pleased that both sides are spared from lengthy and distracting litigation."

Larry Sutter, chief executive officer at Northwest and former vice-president and general manager of Tektronix's Design Automation Group, said the settlement "makes clear that Northwest has no intention to misuse any confidential or proprietary information of Tektronix."

Tektronix, which has seen many employees leave to begin spinoff companies in the Portland, Ore., metropolitan area, said the lawsuit did not indicate a change in the company's handling of start-ups. The company said it traditionally has had friendly relations with start-ups and has even funded some through the Tektronix Development Co.

Northwest was founded in 1981 by Sutter and Jon Birck, a former Tektronix employee who is now a director at Northwest.

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Otrona ceases operations, dismisses all 175 employees

By Paul Danish
Special to CW‡

BOULDER, Colo. — Portable computer maker Otrona Advanced Systems, Inc. recently ceased operations and dismissed all 175 of its employees.

The privately held company said the decision was based on its inability to obtain further credit and infusions of capital, together with higher than expected production costs for its newest product, the Otrona 2001.

Employees were told at 3 p.m. Oct. 16 that the company would permanently close at the end of the business day. Workers received full pay through the last day of operations.

President Jim Lindner said the firm would not have been able to continue making its payroll if it had stayed open.

Otrona announced its 2001 model last May. The 19-lb Intel Corp. 8088-based transportable claimed a very high degree of compatibility with the IBM Personal Computer and some advanced design features, including a tilt-screen CRT, and at the time attracted generally favorable comment.

The machine replaced the earlier Otrona Attache, a slightly smaller, Zilog, Inc. Z80A CP/M machine that it began marketing in March 1982.

The Attache was distinguished by being only one-third the size and two-thirds the weight of most competing transportables, yet offering an 80-col. display and two double-sided, double-density disk drives.

Although the computer attracted positive reviews, its initial price of $3,995 kept it from achieving the wide appeal of competing 8-bit machines, notably the Osborne Computer Corp. Osborne 1 and Kaypro Corp. Kaypro II.

In July of 1983, the company offered an upgraded version of the machine incorporating an Intel 8086 board as well as the Zilog Z80A, which it said offered IBM Personal Computer compatibility and twice the speed.

However, its last offering, the completely redesigned 2001, used an Intel 8088 CPU.

Otrona President Lindner said the computer was selling well and the company had more orders than it could fill, but that production costs were running 25% to 30% above initial projections. Although the company was receiving 1,000 orders a month for the 2001, it was not making money on the orders it was filling.

The company could not raise the 2001's $3,000 base price and hope to compete with IBM and Compaq Computer Corp., he added.

Though the company has shipped several thousand machines, he said, lenders sharply reduced its credit several weeks ago. The decision to cease operations was taken when additional funding could not be found.

The company nonetheless opted not to file for bankruptcy and will seek to meet its obligations through "an orderly self-liquidation," Lindner said.

The firm is also hoping to find a buyer. Lindner said there have been several expressions of interest.

Otrona is closely held; financial data is not publicly available.

Danish is a free-lance writer based in Boulder, Colo.

Eagle struggles to remain afloat

By Kathleen Burton
CW West Coast Bureau

LOS GATOS, Calif. — Eagle Computer, Inc., an IBM-compatible microcomputer manufacturer struggling to stay in business, announced earlier this month that it will close its headquarters here and move operations to its Southern California plant in Garden Grove.

The company recently announced a loss of $17 million on sales of only $4.9 million in the fourth quarter ended June 30; for the year, the company reported a loss of $26.4 million on sales of $48.4 million. The company's chief executive, Ronald N. Mickwee, announced his resignation effective Nov. 5, and Gary Kappenman, who founded the company with his brother Charles, was named president and chief executive officer. Mickwee will stay on as chairman.

Fifty-five employees will lose their jobs when Eagle's headquarters close, leaving the company with 65 employees, a spokesman said. The consolidation and layoffs will lower Eagle's expenses so the company can survive on flat sales.

Eagle also has been attempting to hammer out a revised debt repayment plan with 65 creditors on an $8.2 million debt. If the creditors do not approve the plan, Eagle could be forced out of business. "Eagle's downward spiral is symptomatic of the IBM-compatible market, which is very soft right now," said Bob Katzive, vice-president of Gnostic Concepts, Inc., a market research firm in Menlo Park, Calif. "Eagle's been in trouble since IBM sued them on patent infringement charges in February and since they kicked off a price war in the IBM-compatible market."

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Business remains brisk for some semiconductor makers

Several Silicon Valley semiconductor manufacturers, belying a recent dip in the book-to-bill ratio that measures industry vitality, said times have never been better.

National Semiconductor Corp. of Santa Clara, Calif., reported a 171% increase in profits over the previous year for the quarter ended Sept. 16. Gary Arnold, chief financial officer and vice-president of finance, said the company, which employs about 12,000 people, is planning on hiring 500 additional employees.

Concerning National Semi's investment in new plant capacity, Arnold said, "Building a plant takes 1½ years, and we can't time capacity too closely" since the Japanese are expanding their facilities rapidly. The demand for semiconductors will continue to grow as integrated circuits become employed in items like parking meters, cars and refrigerators, Arnold said.

Demand for Intel Corp. parts still outstripe capacity, according to Michael Janas, a spokesman for the Santa Clara-based company. Janas said Intel had been "aggressively second-sourcing [contracting with outside manufacturers to provided Intel-designed parts] for the last year and a half." Intel is also hiring, Janas said.

Eliott Sopkin, a spokesman for Advanced Micro Devices, Inc. (AMD) said the company recently set new earnings and sales records, with over $257 million in net sales for the quarter ended in September, compared with almost $129 million the previous year. AMD expects to achieve $326 million in net sales for the year, he said.

Sopkin said manufacturers cannot alter research and development plans for proprietary products or base capital spending decisions on industry cycles, or they would not be ready for market upturns.

"Business is still good," said Charles C. Harwood, president of Signetics, Inc., a Sunnyvale, Calif.-based chip manufacturer. Production has increased 70% over the previous year, and the company predicts $740 million in sales by the close of 1984. Signetics' recent capital expenditures were necessary to respond to the Japanese, Harwood said, referring to a $50 million very large-scale integration R&D facility that opened in October.

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April 1984, when manufacturers thought there was a capacity shortage, were double orders, Gumport said, over two months of double orders need to be swept clear before a representative picture can emerge.

He said the industry may rebound during November, usually a strong month for the industry, if the economy continues to accelerate.

Some industry observers say the semiconductor industry overaggressively jacked up production capacity for a growth trend that failed to materialize when the personal computer market tightened its belt.

Gumport indicated that if the increased fabrication capacities of major players such as Advanced Micro Devices, Inc., Intel Corp., National Semiconductor Corp., Monolithic Memories, Inc., Motorola, Inc. and Texas Instruments, Inc. come on-line simultaneously, the result could be a severe price erosion in the third or fourth quarter of 1985. But if the economy grows at the predicted 3% to 4% rate during 1985, there will not be an overcapacity problem, Gumport added.

Brian Boyle, an analyst at Dataquest, Inc. in Cupertino, Calif., said that U.S. chip manufacturers have beefed up capacity and increased 1984 research and development expenditures a whopping 72% over 1983 levels in response to a $2.8 billion capital spending boost by the Japanese.

This global strategy is risky in the cyclical integrated circuit industry, according to Boyle, "because excessive capital expenditures are like borrowing from the future. You can't survive by going 60 [miles an hour] when the rest of the traffic is only going 30."

The primary danger for chip makers will come from companies that start cutting prices because of worries about an approaching recession, or because they are producing chips offshore, said Doug Sparks, vice-president of Gnostic Concepts, Inc., a market research firm in Cupertino, Calif. Micron Technology, Inc., a Boise, Idaho, manufacturer, recently dropped the price of its 64K dynamic random-access memory chips from over $3 to less than $2 each, Sparks said, softening prices in the 16K, 64K and 256K chip markets. Micron was able to do this because it licensed a Korean chip maker who is able to produce chips in volume quantities — a growing trend in the industry, he explained.

DEC posts 41% increase in first-quarter revenues

MAYNARD, Mass. — Digital Equipment Corp. last week reported first-quarter revenues of $1.51 billion, up 41% from year-earlier revenues of $1.07 billion. Profits for the quarter were $144.2 million, or $2.45 per share, which included a nonrecurring benefit of $63.2 million, or $1.07 per share, due to tax law changes.

The nonrecurring benefit reflected a change in U.S. tax laws earlier this year eliminating domestic international sales corporations of U.S. vendors and forgiving accrued taxes that had been deferred under previous law. DEC said the $63.2 million was accumulated over a 12-year period dating back to the establishment of domestic international sales corporations in 1971.

Excluding the tax benefit, DEC posted profits of $80.9 million, or approximately $1.37 per share, compared with year-earlier profits of $15.8 million, or 28 cents per share.

One year ago, DEC shocked Wall Street with an announcement that the first-quarter 1983 results would show a sharp reduction in earnings from the previous year; in the comparable quarter of 1982, DEC showed a profit of $56.8 million, or $1.02 per share, on revenues of $927 million.

For the first quarter ended Sept. 29 this year, the company reported equipment sales of $1.03 billion, a 48.7% increase over year-earlier sales of $696 million. Revenues from nonequipment categories were $479.6 million, a 26.8% increase.

DEC experienced a dramatic increase in pretax earnings for the first quarter of this year, reporting a 338% hike to $103.8 million, compared with $23.6 million one year ago. Taxes climbed from $7.8 million one year ago to $22.8 million.

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Profits up 12% for Burroughs

DETROIT — Citing improved operating margins, Burroughs Corp. said its third-quarter profits increased 30%.

Profits rose to $50.2 million, or $1.11 a share, compared with $38.6 million, or 92 cents a share, in the year-earlier period.

Revenue rose 12% to $1.15 billion from $1.03 billion a year ago.

"Our steady improvement in performance was achieved despite the continuing negative pressure from a strong U.S. dollar and the slower than anticipated production of the [Memorex Corp.] 3680 disk drive," Chairman Michael Blumenthal said.

Memorex is a Burroughs subsidiary.

Tax gain boosts Sperry profits

NEW YORK — Sperry Corp. recently reported that its profits for the second quarter rose 244% to $99.5 million, or $1.80 a share, from $28.9 million, or 55 cents a share, a year earlier.

The jump in profits was mainly attributable to a reversal of deferred income tax liabilities amounting to $64 million, or $1.16 a share, Sperry said. Excluding the tax gain and the firm's previously announced $2.3 million write-down of its investment in Trilogy Ltd., profits rose 31% over last year's second quarter.

Revenue rose 10% to $1.24 million from $1.13 million a year ago.

The company said its Computer Systems division, which was reorganized and renamed the Information Systems division last month, reported a 6% decline in profits on an 8% revenue gain.

Gerald G. Probst, chairman and chief executive officer, said profits for the quarter were adversely affected by the relative strength of the U.S. dollar, competitive pressures and higher R&D expenditures.

The company also said shipments of some military computers have been delayed because they contained semiconductor chips manufactured by Texas Instruments, Inc. In September, the Department of Defense said that TI had inadequately tested chips supplied to the military. The government halted acceptance of shipments from defense contractors pending further testing of computers containing TI chips, a Sperry spokesman said.

Prime registers 88% quarter rise

NATICK, Mass. — Prime Computer, Inc. last week reported third-quarter profits were up 88%, exclusive of nonrecurring items, with revenue 26% ahead of the comparable period one year ago.

The company reported that profits were favorably impacted by $9 million because of federal government action this year forgiving income taxes accrued by domestic international sales corporations and negatively impacted by a $1.6 million write-off for investment in Compeda Ltd.

Excluding those items, the company reported profits of $14.4 million, or 30 cents a share, compared with year-earlier profits of $7.5 million, or 16 cents a share. Including the nonrecurring items, Prime reported profits of $21.8 million, or 46 cents a share.

Revenue for the quarter ended Sept. 30 was $165 million, compared with $131.2 million a year earlier.

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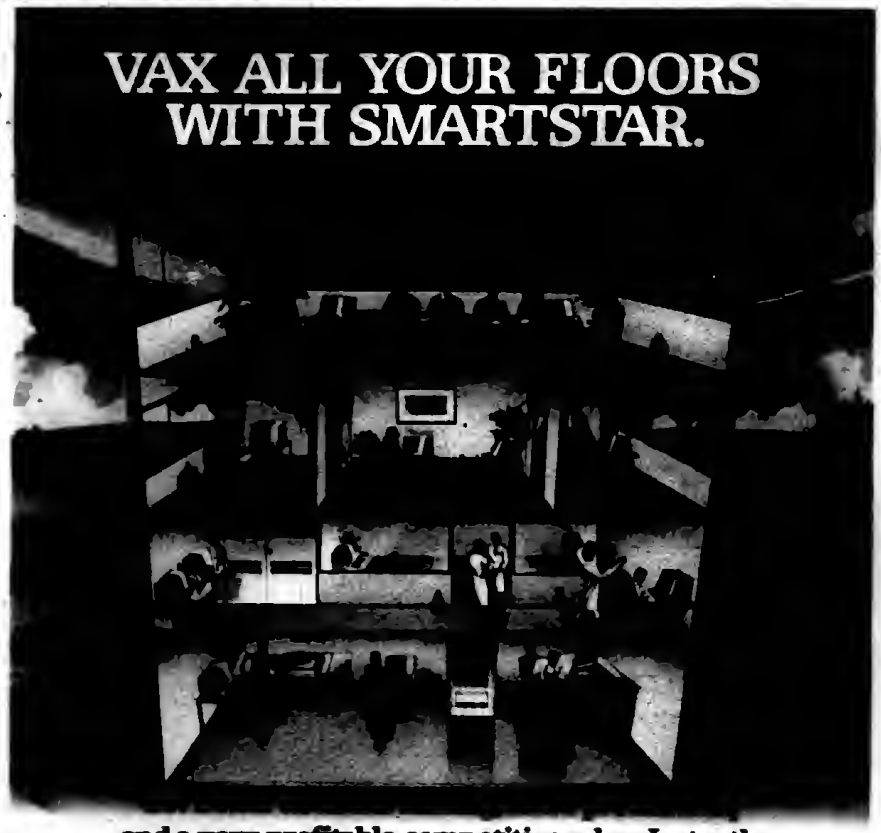

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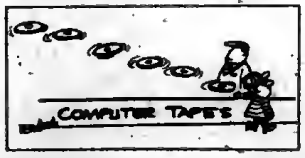

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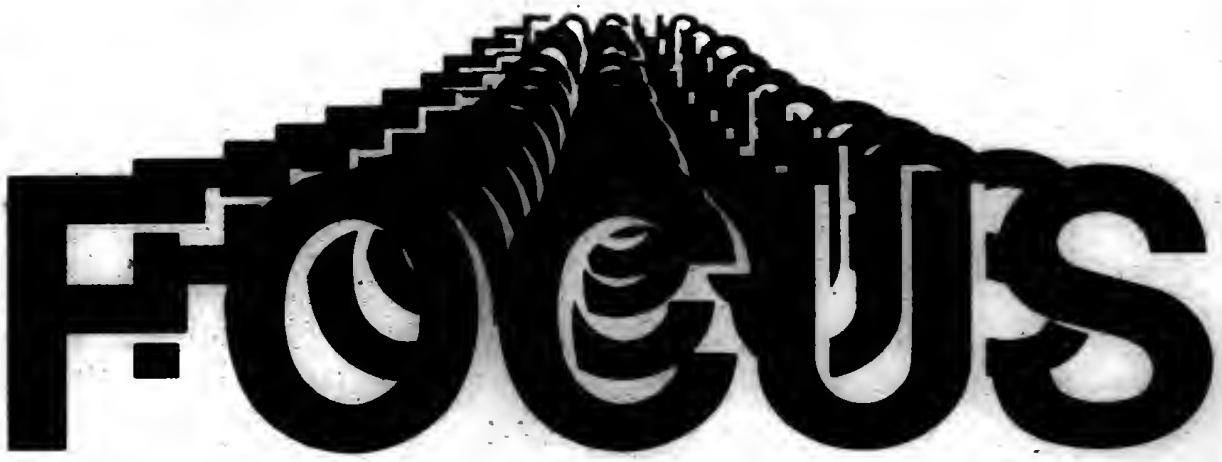

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MERGE from page 121

firm Olivetti Corp. by AT&T.

In 1983, Cerberus said, the dollar value of transactions was $966 million, up 45% from $660 million in 1982, but the number of transactions was only 142, down 24% from 188 transactions in 1982.

Published just before the IBM announcement, the report concluded that 1984 could produce between 160 and 203 transactions, while the total dollar value paid could amount to between $4.1 billion and $4.7 billion.

Despite the apparent increasing trend in mergers, Cerberus said the industry consolidation does not necessarily result in industry concentration.

Citing research by International Computer Programs, Inc. of Minneapolis, which tracked the top 100 software and services companies in the U.S., Cerberus concluded that concentration has tended to decrease since a peak in 1980. In 1979, according to the report, the top 20% of the 100 firms generated 73% of revenues for the group; in 1980, that increased to 75% of the total revenues, but declined to 72% in 1981 and 70% in 1983.

1985 is likely to bring increased merger and acquisition activity.
—The Cerberus Report

The report claimed "that the computer services industry is not dominated by a handful of very large firms, but by 200 firms that make up the tip of the iceberg."

In marked contrast to perceptions that concentration is stifling the computer industry, Cerberus reported that the number of firms involved in the industry grew from 12,149 in 1979, to 15,052 in 1981, to 20,429 in 1982 and to an estimated 25,806 in 1983.

Cerberus determined that the largest growth was in the programming and software area, with the number of firms growing from 3,807 in 1979 to 13,963 in 1983.

Employment in the industry was estimated by Cerberus to have grown 22% between 1983 and 1984 to a total of 440,000.

The report predicted that 1985 is likely to bring increased merger and acquisition activity if the economy continues to be strong and funds remain available.

Priced at $375, the report is available from the Cerberus Group, P.O. Box 470, Frenchtown, N.J. 08825.

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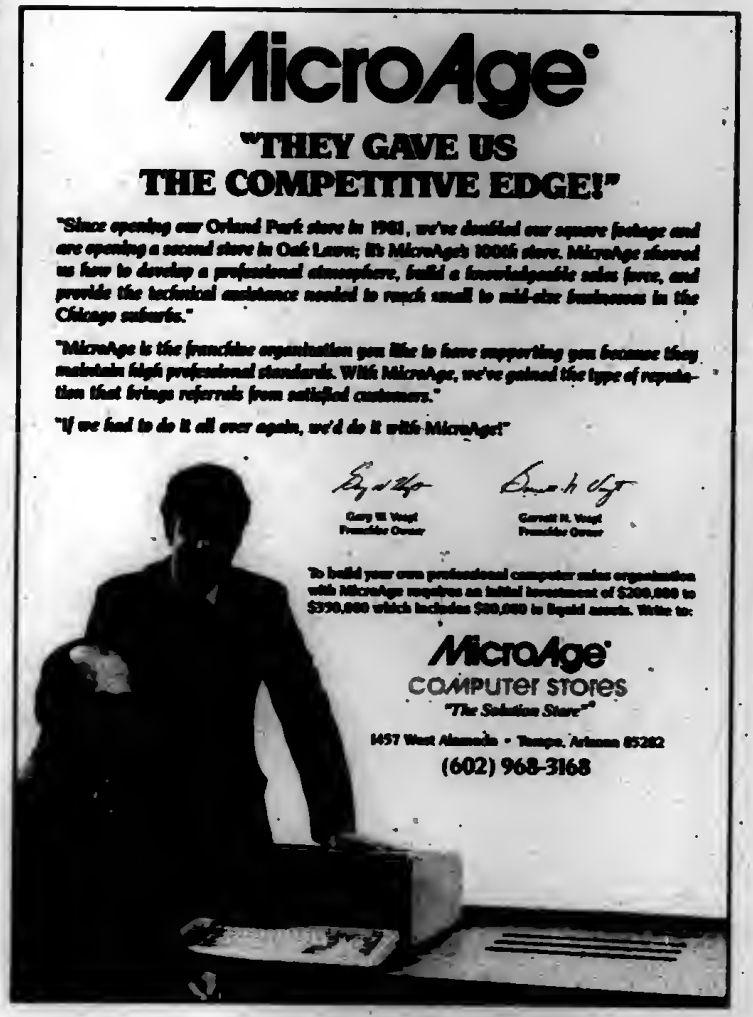
venture capital firms. These included First Interstate Ventures, Hambrecht & Quist and the tremendously successful new custom very large-scale integrated gate-array microchips manufacturer LSI Logic Co., among others. Sequent developed an AT&T Unix-based multiprocessor series of superminis ranging in speeds from 1.4 to 7 Mips and plans to hit $100 million in revenues in five years with plans to reach $1 billion within a decade.

Ridge Computers, Inc. is another recent venture developing a Unix-based supermini designed with computer-aided design applications in mind that will offer speeds up to 8 Mips. The company received $9.6 million in three rounds of financing from Fayez Sarofim, F. Eberstadt, Hambrecht & Quist, Montgomery Securities and French interests represented by Groupe-Bull and La Compagnie Financiere.

Foreign interests show up among investors of at least three other supermini ventures. Charles River Data Systems, Inc., which manufactures another high-performance supermini, has Japan's Sord Computer as one of its backers as well as corporate investments from Analog Devices, Inc., Datapoint Corp. and EG&G.

Plexus Computers, Inc., another AT&T Unix-based supermini developer, has British interests represented by the Abingworth Ltd. among its blue-chip venture capital investors, who also include Chatham Ventures, Hambrecht & Quist and others. Elxsi, which makes a 64-bit multiprocessor supermini, received its original financing from Tata, an Indian conglomerate, and Singaporean interests as well as American investors. Others, like Apollo Computer, Inc. and Masscomp Co., have already gone public.

Clearly such worldwide interest in American supermini ventures is not without reason, and when such a lot of knowledgeable investors are betting on an industry, it is bound to come up with a few winners.



DISK from page 121

tional Memories, Inc. in Cupertino, Calif., a former IBM supplier, will close its doors in January, and Seagate Technology, Inc., another hard disk manufacturer, reported flat sales and only the slenderest of profits for the first fiscal quarter.

What's gone wrong? Industry pundits are citing everything from the industry's seasonal softness, to technology shifts requiring a major manufacturing retooling, to questionable management decisions, to the invasion of Japanese vendors eager to capitalize on superior low-cost, high-volume manufacturing capabilities.

U.S. vendors, caught in the margin deterioration resulting from an overcrowded market and facing a tidal wave influx of Japanese disk makers and a soft personal computer market, must make difficult choices in the months ahead.

"The shakeout in the floppy disk industry started two years ago. I think it will continue, with one or two companies going under or getting bought every year," said Bob Katzive, vice-president of Gnostic Concepts, Inc., a market research firm in Menlo Park, Calif. Katzive said the key is to go offshore, reducing manufacturing costs and increasing production volume.

Another alternative is to control costs by vertically integrating manufacturing, said Bob Gaskin, a senior analyst at Dataquest in San Jose. He cited Xidex Corp., which posted a 468% growth rate last year. In 1983, Zydex built a manufacturing plant that enabled it to perform an expensive media "web-coating" procedure in-house.

Most of Xidex's 80 competitors, Gaskin said, must still contract with outside vendors to perform the process, slicing 15% from their already slender profit margins. Gaskin said margins for floppy media fell from $1.25 to less than $1 last year when consumer-savvy Japanese vendors like Teac, Sony Corp. and Panasonic Co. entered the market. Even Japanese companies not previously in the disk drive industry, like Janome Sewing Machine Co., Ltd., a Japanese sewing machine manufacturer, jumped into the fray then, he said.

"Because personal computer manufacturers have already made product decisions for next year's products, it's now too late for companies who didn't lower their manufacturing costs," said John Hoper, vice-president of the Peripherals Division of Future Computing, Inc., a market research firm in Richardson, Texas. He said, however, there are several survival strategies remaining for mainstream companies unable to compete strictly on price and volume: handling U.S. distributorships for Japanese suppliers or targeting specialty markets with high-capacity disks or technologically advanced removable disk products. Hoper lauded Tandon Corp., a 5¼-in. floppy disk maker that shifted manufacturing operations offshore to Singapore and Bombay, India, several years ago and, unlike the rest of the pack, recently posted a 27% increase in third-quarter sales. "[It'll] survive," Hoper said. Other companies, such as Seagate Technology and Miniscribe, are following its lead offshore.

James Porter, president of Disk Trend, Inc. a research firm in Los Altos, Calif., blamed the industry's problems on a short product life cycle, forcing companies to retool their manufacturing facilities and establish new OEM relationships every three to seven years, opening the door even further to the Japanese.

Other analysts say IBM is kicking sand in everyone's face and shrinking OEM opportunities by manufacturing small floppy disks and hard disks in-house and driving micro competitors out of business with its Personal Computer XT and AT.

Some floppy disk companies have simply made classic bad management decisions, according to analysts. Verbatim Corp. changed its product without vendor approval, losing two quarters of business to a large customer, rumored to be IBM, and Dysan Corp. spread its resources too thin by backing unprofitable seedling companies and a 3¼-in. format that proved to be unsuccessful.

As Marshall McLuhan once said, "the medium is the message," and it looks like the message for the disk media and drive industry is already on the wall, written in Kanji script.

XIDEX from page 121

to analysts, was a result of spreading resources too thin by backing unprofitable seedling companies and a 3¼-in. floppy disk format that has not been successful in the marketplace.

Zaccaria said he is not concerned about Dysan's recent losses. He claimed Dysan has corrected its problems by severing relations with six unprofitable seedling companies, consolidating manufacturing operations and laying off 600 of its workers.

"With the merger, Xidex now has all their bases covered," said Bob Gaskin, an analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm.

According to Gaskin, Xidex and Dysan stand poised to attack both the floppy and hard disk marketplaces.

Xidex gained 10% of the floppy disk market last year, recently acquired Evotek Inc., a maker of an advanced coating technique for Winchester disk drives, and is expected to solidify negotiations with Eastman Kodak Co. to produce conventional floppy disk media for that company, he said.

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Now you can team up with our leading-edge products and top-notch systems professionals. You'll be involved with pre and post sales efforts associated with NCR minicomputer hardware and application software systems.

If you have 2 or more years of experience working with minicomputer/interactive systems and/or Cobol programming, you may be the person to complement our team of technical marketing support professionals. A college degree in computer science or business, or equivalent experience, is required.

We also offer an outstanding benefits package and an atmosphere where the challenge, reward and recognition are as great as any opportunity in the business world today. For prompt, confidential consideration, forward your resume and salary history to: Steve Dubin, NCR Corporation, 498 Cranes Roost Blvd., Suite 220, Altamonte Springs, FL 32701.

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SYSTEM 38 PROFESSIONALS

Location - Pittsburgh

Technical

- TELECOMMUNICATION SPECIALISTS
- SYSTEMS PROGRAMMERS

Develop and implement an extensive telecommunications network in a distributed processing environment with system 38's. Communicating in (SNA/SDLC) and (BSC) protocols over switched and non-switched lines using a variety of transmission speeds to a broad range of devices. Provide a full range of support to the interactive-/batch environments for applications development concurrent with normal production activities. Develop APPC programs for a peer relationship between multiple system 38's. Use performance measurement tools to identify potential operating improvements. The candidates for the above position will have a minimum of two years' experience on System 38 utilizing RPG II or III. IBM Series/1, Audio Response, and/or IBM PC experience a plus.

Applications

- SENIOR PROGRAMMER ANALYSTS
- PROGRAMMER ANALYSTS

Senior candidates will have systems design experience and 3-5 years of programming experience. Good communications skills are required because of the extensive user interaction that will take place while designing many new systems. No old systems currently exist that need to be interfaced to, enhanced, or maintained. A working knowledge of RPG III, Basic, or COBOL is required. System 38/36/34, or System/3 experience is a plus. We are seeking ambitious, self-starters who have a desire to use their developmental skills in multiple System 38's environment.

We are a new Pittsburgh based subsidiary of a billion dollar service corporation, the leader in our industry. This is a unique opportunity to get in on the start up of a high growth operation. We offer an excellent compensation and benefits program. Qualified candidates should send their resume and salary history, in confidence, to:

CW-B4092
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SYSTEMS MGR.

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Design, code, debug and document proprietary computer software products in the area of secured communications and verify secured operating systems, using C computer language and database management techniques. Forty hours per week. $30,000 per year. Must have BA/BS Degree plus thirty-six quarter hours graduate work in Computer Science. Must design security features in database management software. Must design and program in Pascal or C computer languages. Applicants will be given technical interview. No training or experience required. Send resume to Illinois Job Service, 402 North Randolph Street, Champaign, IL 61820. Attn: Wanda Byrd. An Employer Paid Ad.

Director, Triangle Research Libraries Network (TRLN) Administer collaborative systems project of the University of North Carolina at Chapel Hill, Duke University, and North Carolina State University. Direct staff in development of online catalog, acquisitions and circulation systems. MLS degree from accredited library school required, degree in computer science preferred. Familiarity with operations of large academic libraries required. Minimum annual salary of $35,000. Send resume and names of three references to Laura Warren, Library Personnel Officer, Davis Library 080-A, University of North Carolina at Chapel Hill, Chapel Hill, NC 27514. Application deadline, December 1, 1984. An Equal Opportunity/Affirmative Action Employer

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To support product development engineers

DURACELL, one of the world's foremost producers of premium batteries, has an excellent opportunity for talented professional with a high degree of statistical and program engineering skills to provide viable guidelines in the product development process.

Working with development engineers, selected candidate will design statistically valid experiments and interpret data for conclusions. Involvement will include the planning of data collection, statistical analysis and research, organization of data for computer analysis, and the purchase or development of hardware/software for data manipulation and presentation.

To qualify, you'll need a BS in Statistics or Computer Science (MS preferred) and 5 or more years experience in applied statistics and computer data reduction. Computer hardware/software expertise essential.

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University Of Alaska
State Wide Administration

The University Of Alaska
Computer Network (UACN)

SYSTEMS PROGRAMMERS II full time permanent position based in Fairbanks, Alaska.

The UACN is seeking a Systems Programmer in an IBM VM/S and VAX VMS environment. The UACN systems staff is responsible for installation, maintenance, and tuning of MVS/SP, JES2, ACF/VTAM, NCP, CICS, IDMS, and other products on a 4381 as well as VMS and layered products on a VAX network in support for the university state wide Asyncronous and SNA communications networks. As a minimum, the successful applicant must possess knowledge of IBM and/or VAX systems software, skilled in assembly level programming, and the ability to maintain, develop, and install computer operating systems. The University of Alaska offers a competitive salary and an excellent benefit package.

Application letters with resume and at least three professional references, must be postmarked by November 5, 1984 and sent to: Statewide Office Of Human Resource Development, University Of Alaska, 888 Tanana Drive, Room 1, Bunnell Building, Fairbanks, AK 99701.

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TECH SUPPORT
DATA BASE ANALYSTS
& PROGRAMMERS

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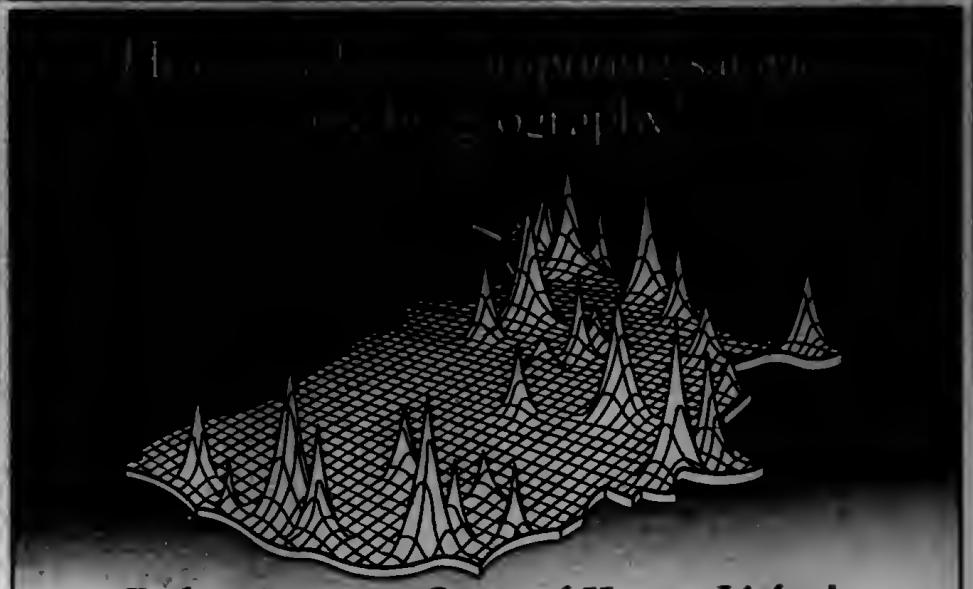

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In our new 1984 Local Metropolitan Computer Salary Survey you'll see how salaries differ by as much as 10, 20 or even 30% from coast to coast.

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Other openings require experience with HP-3000, Model 44 or above with interactive systems application development. Still other openings are in workload analysis, knowledge processing analysis, and expert systems decision and development analysis.

Applicants should have a BS or MS in Computer Sciences, Industrial Engineering, Business Management or related fields, and significant experience with data base and information systems development. Experience with either IBM or DEC mainframe is required.

Martin Marietta Energy Systems, Inc., offers an excellent salary and benefits package, and a generous relocation program. U.S. Citizenship is required.

Qualified applicants should send resumes to:

Mr. E.A. Woy
Martin Marietta Energy Systems, Inc.
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P.O. Box M
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(Junior Level)
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Support of real estate, utility billing and other computer systems. BA/BS (or equivalent experience) & one year experience required.

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Salary Range
- $24,344 to $32,560

Technical support of DBMS and CICS. AA (or equivalent experience) & two years experience required.

Arlington County is a state-of-the-art environment comprised of IBM 4381, VM/VSE, Datacom/DB, IDEAL.

Arlington County
Personnel Department
2100 - 14th Street, N.
Arlington, VA 22201
(703) 558-2167

DATA BASE ANALYST

Greyhound Capital Corporation, a major computer and equipment leasing organization, has a need for a Data Base Analyst in an IDMS environment.

Candidates must be experienced in IDMS operations and utilities and in the development of Schemas, Subschemas, OMCL's and CV/DC Sysgens. Our environment includes MVS on a IBM 4341, TSO/ISPF, INTERACT and CICS. Proficiency in these products is preferred.

Greyhound Capital Corporation offers an excellent compensation and benefit package. Interested applicants may submit resume and salary history to:

Joanne L. Palmertree
Manager, Human Resources
Greyhound Capital Corporation
Greyhound Tower, Sta. 1443
Phoenix, AZ 85077

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GREYHOUND CAPITAL CORPORATION

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NEXUS Associates has been retained by a nationally recognized "Fortune 100" financial services industry leader to locate and recommend 40-50 highly qualified MIS and database software professionals for career opportunities available over the next few weeks.

THE PROJECT WE ARE TALKING ABOUT—
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The hardware environment is IBM 3081 and 4341 under MVS. The on-line interactive database projects are being developed primarily on IDMS. This project involves creating an entirely new network architecture and building prototype systems that will become industry standards.

THE KIND OF PEOPLE WE WANT

We want people who love challenge, who thrive on change, are creative and self-starting. For most positions a Bachelors degree or equivalent experience in data processing is preferred. Candidates should possess top notch organizational, oral and written communication skills.

REWARDING EXCELLENCE

Talent and effort are rewarded both financially and with increased responsibility. *The compensation package is extremely competitive*—and includes company-paid benefits, savings and stock ownership plans, credit union, educational assistance, relocation, and free parking.

THE EXPERIENCE WE ARE LOOKING FOR

We are especially interested in professionals with 2-4 years of IDMS experience including hands-on knowledge of ADSO, CULPRIT, and other Cullinet software enhancement tools. A strong background in COBOL is required for most positions and a solid working knowledge of TSO/SPF and IBM MVS JCL is preferred.

POSITIONS: Programmer Analysts/Applications Development, Technical Analysts/Development Support, Senior MIS Analysts/Data Processing Planning, Senior Technical Analysts/Configuration Management, Senior Database Administrators, Project Managers, Senior Systems Analysts/Applications Development, Senior Operations Managers.

AREAS: Database Design & Development, Requirements Analysis, Configuration Analysis/Management, Data Communications Analysis, Network Architecture, Performance Monitoring & Evaluation, Quality Assurance & Standards, Applications Systems Development, Documentation, Training, Operations.

For interested and qualified candidates, initial interviews will be arranged in your local area. For immediate consideration, please call or forward your resume in confidence to George A. Ridenour, President, NEXUS Associates, 5801 Leesburg Pike, Suite 101, Falls Church, Virginia 22041 Telephone: (703) 998-6363.

Telecommunications Manager

If you are looking for a co. large beyond generating NCP and are a strong self starter with good technical skills, you may be the person to expand our present data communications network to include over 300 IBM PC/ATs. Your duties will also include managing and maintaining our current SNA and ASYNCH network comprised of more than 500 terminals, Series 1, System 34, and PC hardware. Knowledge of VTAM, NCP, SNA/SDLC and asynchronous communications is required.

In addition to the data communications responsibility, you will be responsible for technical support of our Northern Telecom SL-1 PABX, and vendor coordination in all telecommunications areas. Excellent working conditions and benefits, competitive salary. Send resume and salary history to:

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IDMS Dallas

Our client companies in the Dallas area have immediate need for the following IDMS skills...

- Data Base Administrators
- Data Base Analysts
- ADS-O Programmer/Analysts

For immediate consideration please forward your resume in confidence to:

Taylor & Associates
415 E. Airport Freeway-Ste. 240
Irving, TX 75062
214-259-0574

Subcontractors invited to reply.

SYSTEMS PROGRAMMER

MVS and/or UNIX

Continuing expansion of our DP activities has created a new position for a systems programmer. Our Technical Support Services environment is diverse and challenging with rigorous performance tuning and data communication activities in addition to MVS and UNIX, and is staffed with highly experienced systems programming professionals.

Our operating environment includes: MVS/XA/3081K-48MB loosely coupled with MVS SP 168AP-16MB with JES2 Shared Spool; TSO; CICS; several performance monitoring systems; TCAM/VTAM and international batch/interactive networking; thirteen VAX-11/780's with UNIX; LAN implementation; DEC and IBM PC's.

Our Data Center supports STN INTERNATIONAL, a major on-line scientific information service for customers world-wide.

Candidates should have systems programming experience, 1-2 years MVS, UNIX, or similar mainframe or minicomputer operating systems experience, a degree in computer science, mathematics or a related field, and should be interested in becoming a member of a rapidly growing DP environment at the current state-of-the-art. Interest in eventual movement into management is desirable.

We offer a progressive benefits program, an attractive campus-like setting, a highly professional working environment, and a salary scale commensurate with your background and experience. In addition, we're located in one of the most livable cities in America. To apply please send your resume, including salary history to:

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A Dynamic and growing aircraft simulation company is looking for a S.E.L. expert. Must be proficient with real-time applications. FORTRAN, Assembler, and MPX-32 2.X and 3.X internals. To Mid 40's.

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Ideally, you will have 4-5 years' EDP auditing plus at least 2 years in systems programming, applications programming or DP operations. Must know COBOL or PL/1. Experience in IBM MVS required.

For immediate consideration, please send your resume in confidence to: Human Resources, MCI Telecommunications Corporation, 701 South 12th Street, Department 1101, Arlington, Virginia 22202.
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MCI Telecommunications Corporation

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ELECTRONIC TECHNICIAN

for Pacific Stars and Stripes, a U. S. Forces newspaper located in Tokyo, Japan, to provide maintenance and repair services for 5 computer computational pagination and typesetting systems, a Pacific-wide military and civilian communications system and other interrelated electronic systems. Applicants must have had at least 2 years of general experience and 4 years of specialized experience, total 6 years, to include experience in the understanding and use of schematic diagrams and the application of electronic formulas. Basic pay $19,973 a year plus a housing allowance or free housing; overtime, commissary and BX privileges, and other benefits. Send resume to reach U.S. Army Civilian Personnel Office, Honolulu, ATTN: RP-NAF, APO San Francisco 96343, no later than 15 November 1984. Applications will not be accepted after this date.

EXPERIENCED SYSTEMS ANALYSTS PROGRAMMER ANALYSTS

The Medical Center of Central Georgia offers data processing professionals an opportunity to join our team. Our applications are primarily COBOL on an IBM 4341 under DOS/VSE with CICS and ICCF. Fourth generation languages are forthcoming. Experience with hospital systems, SOLC, VSAM, and controls a plus. We offer competitive salaries and an excellent benefit package. To learn more about these opportunities, send your resume to:

Personnel Department,
Medical Center of Central Georgia,
P. O. Box 6000, Hospital Box 151,
Macon, Georgia 31208.

Affirmative Action/EOE

DATA BASE ADMINISTRATOR

We seek an individual to supervise the DBA function in a large scale MVS, IDMS, IBM/3081 environment.

Responsibilities include physical data base design, recovery/restart planning, data base implementation and tuning and application development support.

Degree in computer science or equivalent with several years data base administration desired. Candidate should be sound in physical data base operation, concepts, and design with a good understanding of data dictionary concepts. IDMS experience preferred. Competitive salary and excellent fringe package. Send resume in confidence to: Ed Boelk, Human Resources, JOHNSON CONTROLS, INC., P.O. Box 591, Milwaukee, WI 53201. Equal opportunity employer M/F.

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National Computer Associates

IMS DATA BASE SPECIALIST

Los Angeles Area

Mattel Toys has an exceptional opportunity available for an experienced IMS Data Base Specialist who would appreciate having a hand in controlling his/her destiny.

As Data Base Specialist, your responsibilities will be to help set up and establish department direction and state-of-the-art environment in this fast growing group. Coordinate the development of new standards and procedures, design large scale IMS systems, using system development methodology and the data dictionary.

We desire at least 3-5 years in data base administration, working knowledge of data base design methodologies and data modeling techniques, systems design, development and implementation using IMS DL/1 and CICS. Also experience, with IMS DL/1 internals, performance and tuning, problem analysis and resolution.

Maintain state-of-the-art knowledge while you break away from the day's slow, unchanging environment. Take Mattel Toys' offer of an excellent salary, generous benefits and a lucrative investment plan. Forward your resume immediately for consideration (principals only) to: Ron Stone.

Mattel Toys
5150 Rosecrans Ave.
Hawthorne,
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Mattel Toys

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DIT

DEPARTMENT OF INFORMATION TECHNOLOGY
COMMONWEALTH OF VIRGINIA

We are looking for people who are looking for a little excitement.

Right now you can be part of one of the most exciting times in data processing/telecommunications history for the Commonwealth of Virginia. Not only will you have the opportunity to work at the leading edge, but you will have a real chance to shape one of the newest data processing/telecommunications merger in Virginia.

The Department of Information Technology serves the citizens of the Commonwealth of Virginia by providing meaningful, cost effective, and responsive information technology guidance, assistance and services.

We are currently accepting applications for the following positions in Richmond, Virginia. Richmond is one of the most conveniently located cities in the mid-atlantic area, just 90 miles south of Washington D.C. In the heart of Virginia, Richmond is about 1 hour away from Colonial Williamsburg, Jamestown, Yorktown and Charlottesville. This capitol city is less than 2 hours from the Atlantic Ocean at Virginia Beach, or the Skyline Drive and the Blue Ridge Mountains.

DIRECTOR OF TELECOMMUNICATIONS SERVICES

The successful candidate will be responsible for organizing, directing, staffing and planning the activities of this division and will play an integral role in building a statewide telecommunications network. Through its three branches - Voice Operations and Engineering, Technical Network Research, and Data Operations/Engineering - this division manages and coordinates the Commonwealth's investments in and uses of telecommunications services, facilities, capacities and products.

Additional responsibilities of these branches include planning and analyzing statewide voice telecommunications needs, statewide data telecommunications needs and development of a statewide integrated network.

DIRECTOR OF ADMINISTRATION

We are looking for an individual who will be responsible for managing and coordinating the activities of three branches within the Administration Division. Branch responsibilities include developing and maintaining a comprehensive procurement and contracting program for data processing and telecommunications throughout the Commonwealth, forecasting information technology needs and providing financial management, accounting and compliance assurance services for the department.

To qualify for these two positions, the successful candidates must have indepth knowledge of telecommunications and/or data processing approaches and techniques and have demonstrated the ability to manage multiple organizational units employing a large number of telecommunications and/or data processing professionals. Requires graduation from a college or university with major studies in a field related to the duties of the positions and extensive experience in the telecommunications and/or data processing field. Related experience may substitute for degree requirements. Strong leadership, supervisory and communications skills are essential.

Both positions will report to the Director of the department. We offer excellent benefits, state-of-the-art technology, relocation assistance and a competitive salary.

Interested candidates should send resume and salary requirements to:

Department of Information Technology
110 S. Seventh Street, Third Floor
Richmond, Virginia 23219
Attention: Personnel Office

EOE/M-F

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Our firm is an established health care oriented management consulting firm with a broad based local and national practice in the private and public sector. Through our Data Processing and Finance Divisions we offer our clients a full range of management consulting services. We offer employees an excellent compensation package directly linked to individual achievement and provide the opportunity for rapid career development.

Qualified individuals must have a college degree, 4+ years systems analysis/development experience of which 2 years must be in health care and possess detailed and well written communications skills. Please send resumes and salary history in confidence to:

Mr. Stephen D. Brown
Executive Consulting Group Inc.
[illegible] Ave. NE, Suite 501
Bellevue, WA [illegible]

EOE

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Engineers

Tomorrow's Challenges Today

Systems Control, Inc., an international leader at the forefront of information technology, is bringing together advanced systems and software products with specific applications to implement and support the most up-to-date computer based systems. Currently we have the following positions available:

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Opportunities exist to provide substantial software support on a major factory automation project. Responsibilities include module design, coding, and debugging, as well as following through with system installation at various locations in the U.S. A computer science degree is required as well as extensive experience in FORTRAN 77, HP1000, RTE—A DOS, real-time control systems, and algorithm design.

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Opportunities exist for Senior Software Engineers to be responsible for the coordination and technical direction and design of PCS-16 projects. This leadership position requires a technical degree in Computer Science as well as familiarity with RSX-11M, FORTRAN, MACRO-11, and Data Acquisition Systems.

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Opportunities exist for experienced Firmware Engineers whose primary responsibilities will be the design, coding, and debugging of microprocessor based systems. These positions require at least 1 year of 6809 or 68000 experience and familiarity with assembly language, "C", and a BSEE degree.

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Opportunities exist for Systems Programmers to assume responsibility for systems programming, integration, testing, and documentation in support of our PCS-16 project control system. This position requires a technical degree in Computer Science, real-time programming experience, familiarity with PDP-11 hardware, RSX-11 operating systems, and FORTRAN.

Business Programmer

An opening exists to assume the responsibility for the development and maintenance of corporate business systems and provide technical support services to users. This individual will be responsible for the performance of system software development including design, coding, testing, and documentation, and will provide assistance in user training for computer center supported systems. A Computer Science degree is required.

Analysts/Programmers

Opportunities exist for Analysts/Programmers to design, code and test advanced application programs for monitoring and controlling electric power systems. A technical degree in either Math or Engineering Science is required along with FORTRAN experience.

We offer a highly competitive salary/benefits program and the opportunity for rapid career advancement through increasingly responsible assignments. To apply, we invite you to forward your resume to: **Systems Control, Inc., 1801 Page Mill Road, Palo Alto, CA 94304, Attn: Professional Employment Dept. CW-1029.** An equal opportunity employer m/f/h/v.

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BS degree in computer science or mathematics is required plus 12 years of ADP systems design and programming experience, including 5-7 years of computer-related management experience. Must understand computer-aided design/computer-aided manufacturing (CAD/CAM) systems and techniques. A knowledge of interactive graphics design systems, which includes programming and database management use in systems and vector analysis, and engineering and engineering-related activities is required. An understanding of the DEC-VAC superminicomputer and associated VMS operating system is highly desirable.

SENIOR PROGRAMMER ANALYST

BS degree in computer science or related subject matter is required plus 4 years of work experience. Must understand interactive graphics systems, graphics language programming, and data-base management use in graphics systems. A general knowledge of engineering-related activities and experience in minicomputer software is also required. An understanding of the DEC-VAC superminicomputer and associated VMS operating systems is highly desirable.

We offer a competitive salary and benefits package. If you are qualified, please send resume and salary history to: **A.E. Stone, Personnel Administrator, PAN AM WORLD SERVICES, INC., Missions Support Services Project, Arnold Air Force Station, TN 37389.** An Equal Opportunity Employer. U.S. Citizenship Required.

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Recognition Equipment Incorporated is an international leader in the development and marketing of information processing systems.

Due to growth and expanded sales, we have several positions available for candidates possessing 3-5 years assembler language programming on microprocessors in any of the following areas: Test equipment development, distributed processing system development, and large system development. Intel experience is desired.

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DATA PROCESSING CAREERS

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INSTRUCTOR POSITION

Contra Costa College is accepting applications for the position of Computer and Information Sciences Instructor. Beginning salary is from $19,032 to $31,884 depending on education and experience. Fringe benefits. For job announcement and application forms, call (415) 235-7800, ext. 3216, or write Contra Costa College, Instruction Office, 2600 Mission Bell Drive, San Pablo, CA 94806. Deadline: November 30, 1984. CCC is an EOE.

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Central and South West is a two plus billion dollar electric utility holding company offering competitive salaries, excellent benefits and stable working conditions. Our Information Services Department, as host center, provides services in a multi-company environment.

Our primary system software is MVS/SP1 with JES2. Additionally we use TSO/SPF, COBOL ROSCOE, and Command Level CICS. Our data base is IDMS. We were recently chosen to be one of Cullinet's beta sites for their new development software! We use Cullinet's 4th generation languages—ADS/O, OLM, CULPRIT, etc.

Each of our current openings needs people with proven analytical skills and user interface experience in addition to technical knowledge and abilities.

If we're the type of company you are seeking, and your experience is from a similar environment, please send your resume and salary requirements to the Employee Relations Department. Principals only.

Programmer/Analyst (Business Applications)
Typical project assignments include construction project management, land management system, corporate shareholder system, etc.
Will provide technical expertise in system design, problem determination and system maintenance efforts. Should have JCL skills and online experience (CICS, VSAM) plus exposure to data base concepts.

Sr. Programmer/Analyst (Engineering Applications)
Multi-project assignments offering multi-company exposure will include CAD/CAM, VM/CMS, transmission design, etc.
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Initial assignment to the mining information management project will result in the development of a total, stand-alone system using state-of-the-art technology.
Will provide online and data base technical expertise in system design and problem determination efforts. Should have related technical skills developed from manufacturing related assignments. IDMS, ADS/O experience important.

Central and South West Corporation
P.O. Box 28004 • Dallas, Texas 75222

Central and South West Corporation is one of the nation's leading electric utility systems, having annual revenues of more than $2 billion. With corporate headquarters in Dallas, CSW serves more than four million people through its operating companies in Texas, Oklahoma, Arkansas and Louisiana.

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Hardware Configuration Manager

We currently have a job opportunity available for a Hardware Configuration Manager in the Data Processing Division, located at our Corporate Offices in Framingham, Mass.

Reporting directly to the Manager of Production Services, this position shall be responsible for all Zayre hardware configuration planning and review of hardware performance and capacity, along with the responsibility for making recommendations for new, or upgraded hardware.

Other duties shall include; hardware installation coordination, vendor negotiation, hardware budget planning and maintenance of equipment inventories.

In order to qualify you must have had at least 5+ years of solid data processing experience, with a proven track record of advancement from equipment operating through hardware planning and analysis for a large computer installation, (e.g. IBM 308x through 308x installations). Must possess strong analytical background along with both good oral and written skills.

If you feel that you can meet these qualifications and are up to this type of challenge, we would like to hear from you.

For confidential consideration, please forward your resume along with salary history to: Zayre Corp., Technical Recruiting Department, Speen Street, Framingham, MA 01701. An equal opportunity/affirmative action employer.

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SYSTEMS OPPORTUNITIES

Tangram Systems Corporation is a start-up organization created by an interdisciplinary team of software R&D and marketing professionals. Tangram is nearing release of its first software product, designing its new data center, and assisting several large clients to build large scale communications networks and to tune their MVS/370 and MVS/XA systems.

Tangram is seeking a variety of professionals to meet the opportunities created by growth. In addition to the skill sets outlined below, Tangram seeks individuals with an interest drive to excel. Tangram employees provide their own motivation and generate a creative R&D environment via the interplay among team members.

COMMUNICATIONS SYSTEMS SPECIALIST – Responsible for large-scale MVS systems communications software support, network configuration, network operations support, and third-level technical support.

The successful candidate will have a degree in a technical field or equivalent experience, a minimum of five years technical experience with ACF/VTAM, ACF/NCP, and associated IBM network management products.

In addition, you will have three years' experience in IBM telecommunications network planning for LARGE IBM SNA networks; familiarity with IBM communications implementation strategy with a transport layer-level (and above) working knowledge of SNA, VTAM, and NCP; experience in communications network support with the ability to diagnose both hardware and software networking communications systems at the systems programming level; strong assembler language programming and diagnostic skills; and, excellent verbal communications skills.

SENIOR TECHNICAL SPECIALIST – Responsible for the installation, maintenance, and customization of large scale MVS/370 and MVS/XA systems software and associated third-party software products. In addition to leading the technical support team, you will provide consultation to the systems software development staff on MVS systems internals.

The successful candidate will have a degree in a technical field or equivalent experience, a minimum of six years technical experience with OS/VS, TCAM/VTAM, SMP, TSO, SPF, and JES2, and comprehensive assembler language programming as well as MVS dump analysis and problem determination skills.

You will be expected to analyze high impact/severity problems in large, complex systems. Experience with ACF/VTAM, ACF/NCP, JES2/NJE, RACF, ACF2, and VSAM will be valuable. Effective written and verbal communications skills, and the ability to work independently are essential.

SENIOR SYSTEMS PERFORMANCE SPECIALIST – Responsible for the performance evaluation and tuning of large-scale MVS/370 and MVS/XA systems software and hardware.

The successful candidate will have a degree in a technical field or equivalent experience, a minimum of ten years experience with large-scale IBM software and hardware, and strong systems background with assembler language programming skills.

You will have recent, hands-on experience with [illegible] systems performance products such as RMF, OMEGAMON, and SAS, and a comprehensive understanding of the MVS SRM and ASM tuning parameters. Experience with shared DASD, solid state and cached paging storage devices, buffered DASD, and 3380 performance planning/configuration will be valuable. Effective presentation skills, coupled with strong verbal and written communications skills are mandatory.

Tangram offers a competitive compensation package that includes profit sharing and stock option plans. Join us in building a dynamic company in one of the fastest growing areas of the country. If your background matches or exceeds our requirements, forward a resume or letter of inquiry with salary requirements in strict confidence to:

Tangram Systems Corporation
Attn: Search Committee
P.O. Box 30308
Raleigh, North Carolina 27622

EOE M/F/H

Programmer Analyst

Holiday Inns, Inc. has installed the most advanced Hotel Management System available today. As a recognized leader in the hospitality industry, Holiday Inns has an exciting opportunity for a programmer analyst to continue development of HMS and interface with our worldwide reservation system.

The successful individual will assume responsibility for designing, programming, testing, and documenting modifications for hotel systems. Experience with both PASCAL and microcomputers or minicomputers is essential, coupled with a degree in Computer Science or its equivalent. A working knowledge of both Assembler and real-time is desired. A hotel background is a plus.

Along with exceptional opportunities for career growth, Holiday Inns offers a highly attractive salary, comprehensive benefits including relocation assistance, and a state-of-the-art environment. For prompt consideration, send your resume with salary history and requirements, in confidence, to: B. King, Recruiting & Selection, Holiday Inns, Inc., 3796 Lamar Avenue, Memphis, TN 38195. An equal opportunity employer m/f/h.

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The individual selected will integrate the VAX cluster into the engineering environment, serve as a focal point for all VAX related hardware and software issues, investigate and implement a front-end communications network, educate users, and coordinate multi-vendor maintenance. This position requires a B.S. in computer science, math or electrical engineering and a minimum of two years VAX systems experience as well as strong communications and organizational skills.

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The ideal candidate should have both technological and management experience in Voice and Data telecommunications.

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Personnel Department-2271

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Large electric utility corporation with centralized data center and four remote sites is seeking an experienced Senior EDP Auditor. Job responsibilities include:

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Please mail resume and salary requirements to the Employee Relations Department. Principals only.

Central and South West Corporation

P.O. Box 220164 • Dallas, Texas 75222

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Spicy! That's the flavor of New Orleans. New Orleans provides its residents an enviable lifestyle. Great restaurants, a warm climate, and world renowned celebrations, such as Mardi Gras and the New Orleans Jazz and Heritage Festival, have kept New Orleans the Queen city of the south.

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MIDDLE SOUTH SERVICES is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consist of IBM 3084, 3081, MVS/XA, 4361 VM, and Tandem. We have the following excellent career opportunities:

ANALYST/PROGRAMMERS Position involves the development of various Business applications using COBOL or PL/1. Knowledge of IMS DB/DC and ADF is considered a plus. Large IBM OS/MVS experience required.

HARDWARE/SOFTWARE PLANNING ANALYST Responsibilities include Hardware/Software evaluation with a concentration in the Telecommunications and networking area. Additional duties include network vendor interface, as well as evaluation of programmer productivity software, user computing tools, multifunction and special purpose workstations, office automation and electronic mail.

VTAM SYSTEMS PROGRAMMER Position involves installation and maintenance of VTAM and NCP software. Experienced in NCP GENS, VTAM table creation and SMP is required.

ANALYST/PROGRAMMER (SCIENTIFIC) Requires previous experience in scientific applications with a sound knowledge of PL-1 or Fortran. Computer applications development with exposure to a VM operating system would be helpful.

IMS SYSTEMS ANALYST Position involves systems analysis in a large scale multi-user IMS DB/DC environment, logical Data Base Design, utilization of TRANSFORM applications generator, testing and debugging on-line IMS programs, and development of reusable field update logic in data management transactions.

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1-800-231-4481

or send resume to:
MIDDLE SOUTH SERVICES, INC.
P.O. Box 61000, NEW ORLEANS, LA 70161

MIDDLE SOUTH SERVICES INC.
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Project Leader

The Metro-North Commuter Railroad Company, located in midtown Manhattan, offers the following challenging opportunity for a Project Leader in its MIS Department. The position reports to the Manager of Applications Support. The position demands excellent project management skills, and the opportunity to develop and maintain detailed task plans. The successful candidate will manage 4 programmers, and will spend appx 50% of the time on project analysis and actual coding. Problem solving, debuging and analysis of MSA financial packages are required, as is user interface.

Candidates must present a working knowledge of OS/MVS, TSO/SPF, VSAM, COBOL, JCL and IBM utilities. IDMS or other data bases, RPG or other report generators. Also required is a minimum of 5 years programming experience. Candidates will find knowledge of Librarian, CICS command level, and MSA financial packages or other financial packages helpful.

Candidates should offer a degree in computer science or finance. IBM user oriented courses or an advanced degree are helpful.

We offer an excellent compensation and benefits package. Please send resume and salary history to TONY FITZHERBERT, Dept CW.

Metro-North Commuter Railroad
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S 38

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For confidential consideration, please forward your resume and salary history to: Personnel Dept. J.E.C., Sperry Corporation, 13430 Northwest Freeway, Houston, Texas 77040.

SPERRY

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TEAM PLAYERS

At GTE Data Services, we've blended a team approach with an entrepreneurial spirit to reach new heights in customer-focused technology. To increase the productivity, cost efficiency and competitive strength of our telephone company customers, we're redefining information management through 4th generation methodologies, networking systems and innovations in intelligent workstations. We'd like you to share in the challenge.

SR. ANALYSTS—To design and develop new distributed processing system in relational data base environment, you must have 5-8 years development experience, background in structured design techniques and knowledge of:

- ►On-line Transaction Processing
- ►Heavy Experience in COBOL
- ►Desire Experience in:
  - •Tandem (Hardware & Software)
  - •Structured Testing
  - •Warnier/Orr Diagrams
  - •Data Base

SYSTEM/APPLICATIONS ARCHITECT—Required qualifications include 3-4 years Systems Analysis/Project Leader experience and background using:

- ►Tandem Equipment
- ►IBM Communication Protocols
- ►IMS or CICS
- ►Communications Interfaces with IBM Mainframes
- ►Ability to provide support to Development Personnel in areas such as:
  - •Solving operating system problems
  - •Setting up Data Base environments
  - •Defining "Pathway" Configurations
- ►Experience with the following
  - •ENABLE
  - •ENFORM
  - •SCOBOL
  - •COBOL
  - •Data Definition Language (DDL)
  - •Transaction Application Language (TAL)
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The above positions require a BS in Engineering, Computer Science, Math or equivalent.

A subsidiary dedicated to Information Management, GTE Data Services offers the challenge of a lifetime, the rewards you deserve and relocation assistance to our Florida Gulf Coast location.

Please submit your resume with salary history to: L. Gerstner, Dept. CWD, GTE Data Services, P.O. Box 1549, DC 136, Tampa, Florida 33601. An Equal Opportunity Employer.

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GTE

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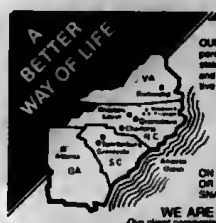

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Clarkson University, in upstate New York, is seeking an individual with experience as a systems programmer in the VM/370 environment. Required experience includes system generation and enhancement, and development using both assembly-level and high-level programming. The Schuler Resources Center furnishes the University with central computing facilities for instructional, research, and administrative functions. Presently installed is an IBM 4341-2 running VM/SP3, a Gould 32/9780 running UNIX, and a VAX 11/780. A broadband cable network using X.25 packet switching provides access to the host systems from throughout the campus. Clarkson is proceeding on a plan to provide all students and faculty with personal computers linked to the Resources Center network.

Our systems group consists of five professionals and operates in an open environment, where each individual is encouraged to promote and develop ideas into actively supported projects. We offer an excellent benefit package, and our employees have the opportunity to enter Bachelors, Masters, and Doctoral degree programs. Send resume and salary requirements, in confidence, to: Richard D. Valente, Director, Educational Resources Center, Clarkson University, Potsdam, New York 13676. An Equal Employment/Affirmative Action Employer.

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Personnel Administrator
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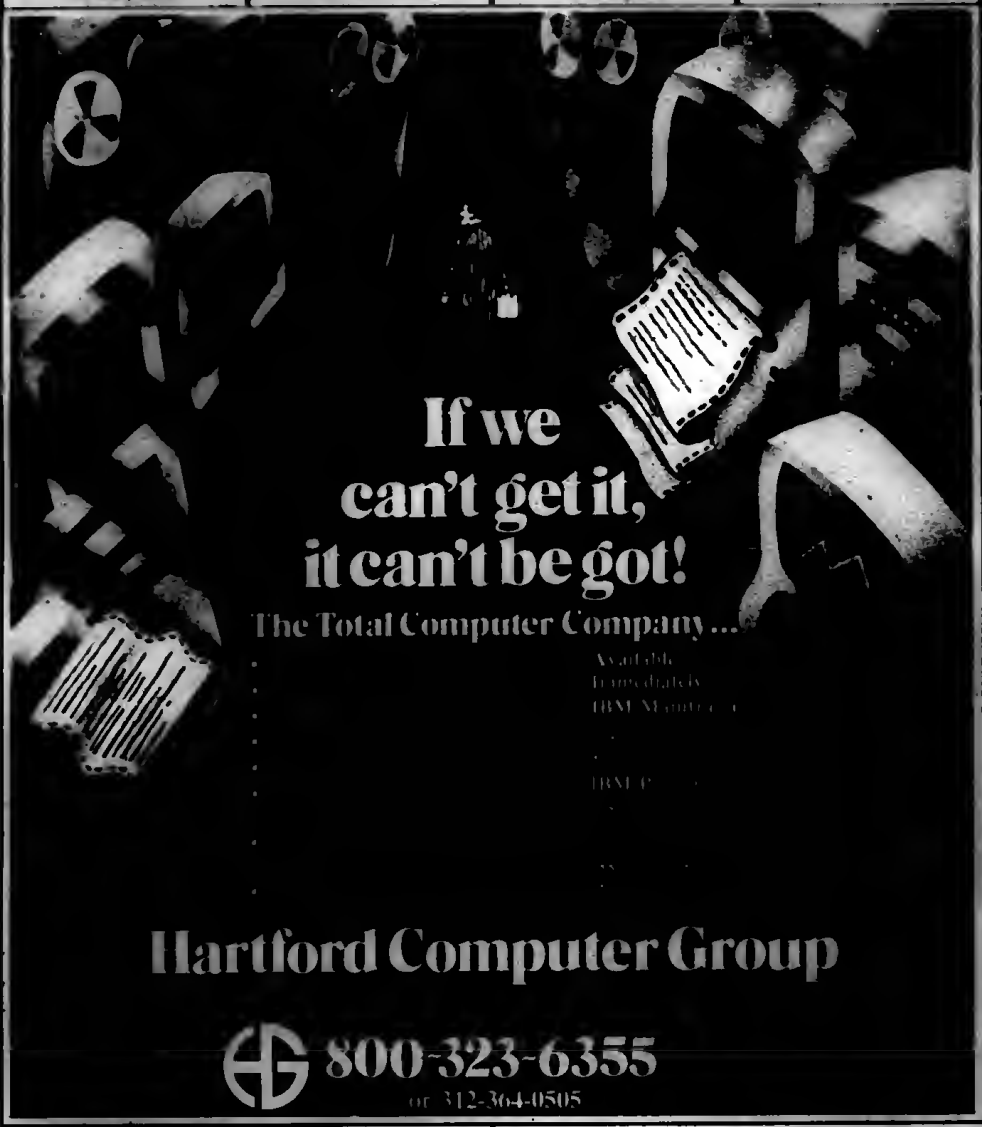

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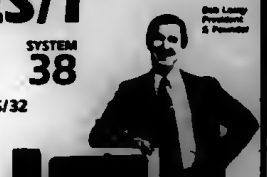

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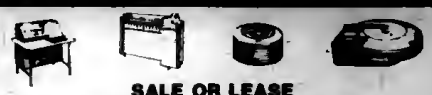

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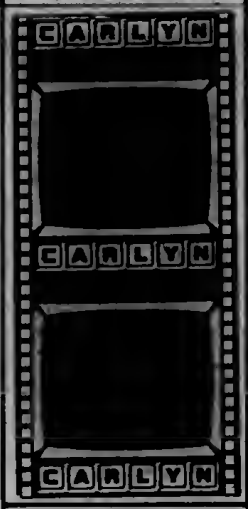

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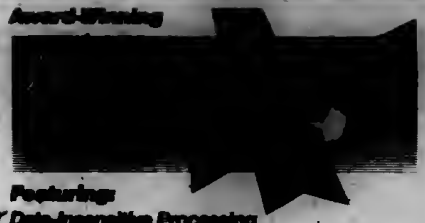

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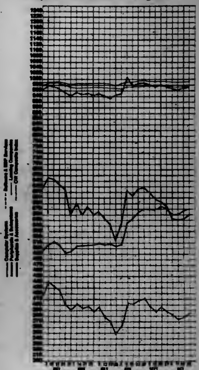

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COMPONENTS

E		1983-84 RANGE	CLOSE OCT 23 1984	WEEK NET CHNGE	WEEK PCT CHNGE
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E		1983-84 RANGE	CLOSE OCT 23 1984	WEEK NET CHNGE	WEEK PCT CHNGE
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E		1983-84 RANGE	CLOSE OCT 23 1984	WEEK NET CHNGE	WEEK PCT CHNGE
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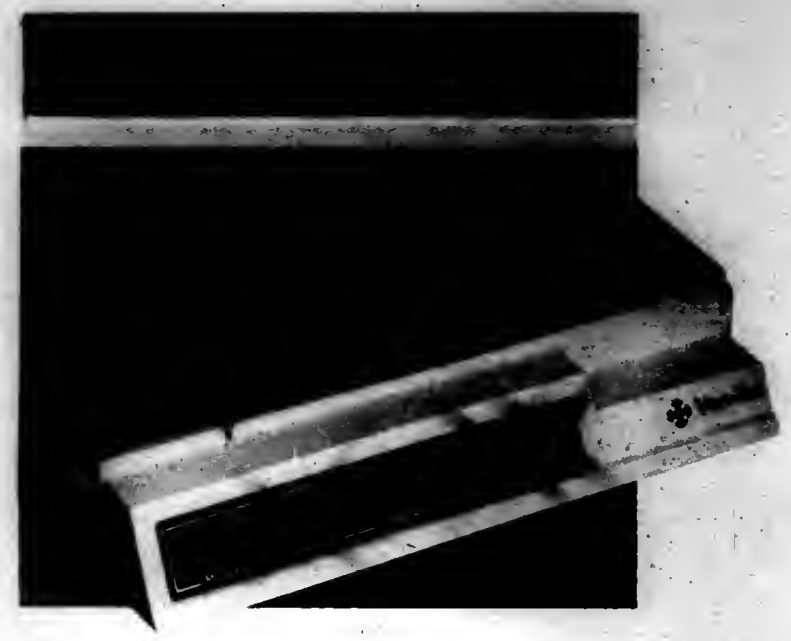

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